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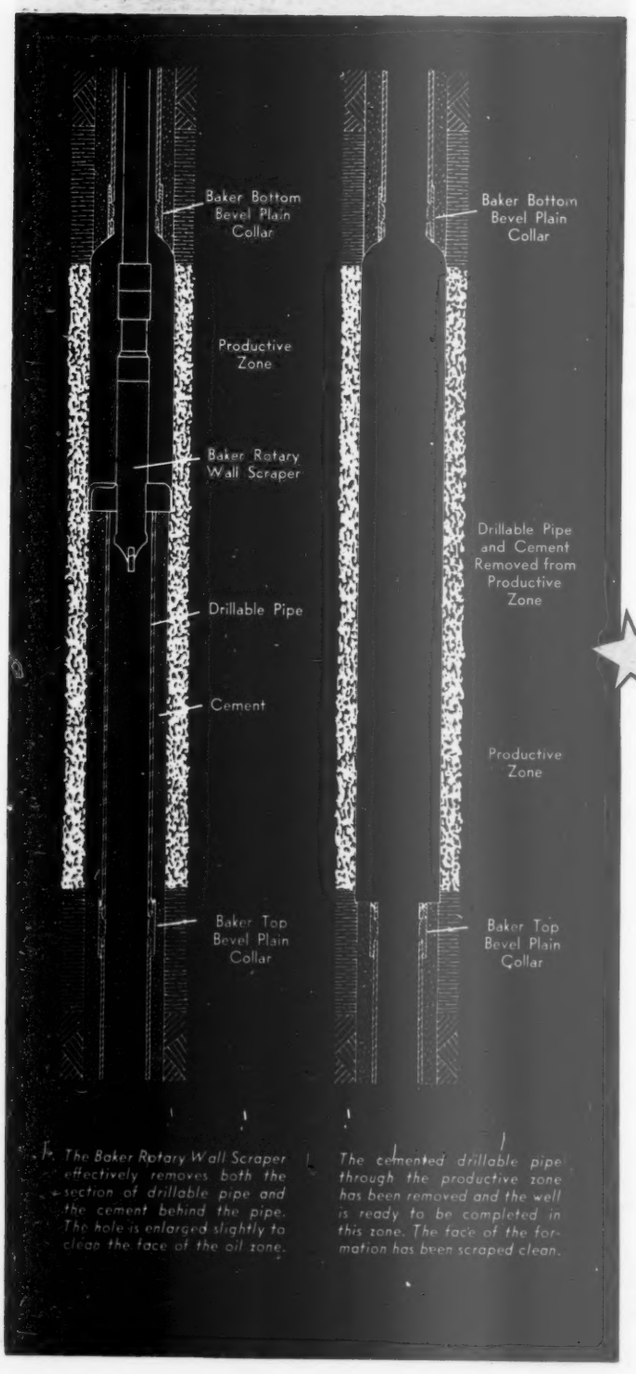
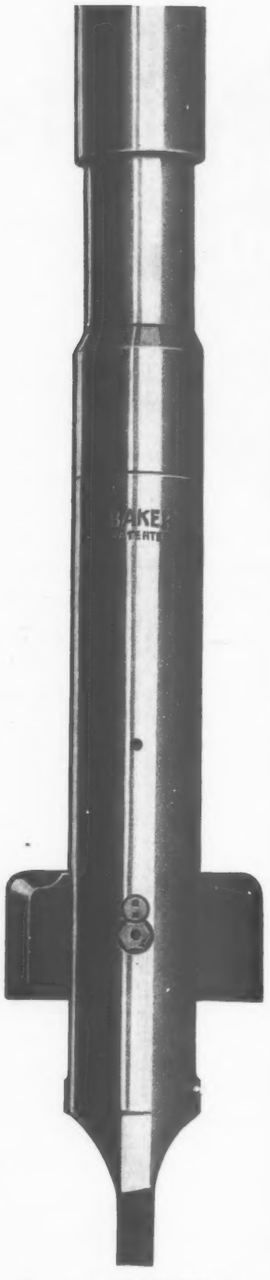
REMOVING SECTIONS OF DRILLABLE PIPE

One of 12 Practical Field Applications For The BAKER ROTARY WALL SCRAPER



The Baker Rotary Wall Scraper effectively removes both the section of drillable pipe and the cement behind the pipe. The hole is enlarged slightly to clean the face of the oil zone.

The cemented drillable pipe through the productive zone has been removed and the well is ready to be completed in this zone. The face of the formation has been scraped clean.



See pages 252-258 of the Baker Section of the 1940 Composite Catalog

Send for Baker Broadcast No. 19

BAKER ROTARY WALL SCRAPER

BAKER OIL TOOLS, INC.
P. O. Box 127, Vernon Station
LOS ANGELES, CALIFORNIA
HOUSTON, TEXAS
NEW YORK, N. Y.

The BAKER ROTARY WALL SCRAPER...

is a simply constructed, versatile tool that Safely and Economically performs a number of important field applications. While designed primarily to enlarge the walls of an open hole, it has proved extremely efficient for several other types of applications . . . one being the removal of sections of drillable pipe such as shown in the accompanying illustration.

TWO TOOLS IN ONE

WALL SCRAPER 2 TOOLS IN WALL SAMPLER

Another application for the Wall Scraper that does not come within the scope of "hole enlarging" is that by substituting special Sampler Blades for the regular Scraper Blades, converts the Wall Scraper into a Wall Sampler. This efficient device will take actual cores from the side walls of any uncased hole. Here is a "TWO TOOLS IN ONE" feature that means DOUBLE VALUE for your money.

Safety and Service

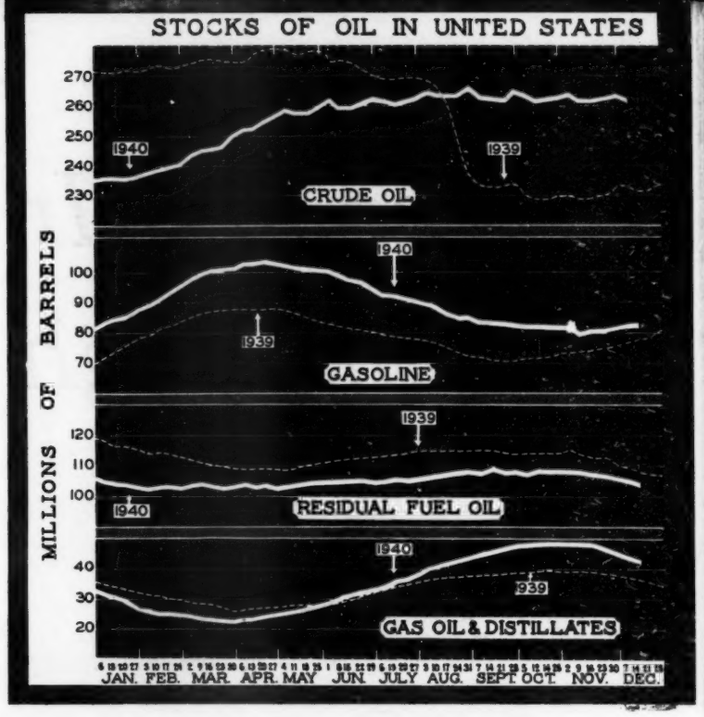
The Safety and Efficiency of the Baker Wall Scraper has been ably demonstrated in thousands of successful runs made in oil fields throughout the world . . . under varied adverse operating conditions . . . and yet to our knowledge, this tool has never failed to come safely out of the hole with hole in condition for further operations.

Important Applications

Enlarging Holes for Casing
Cleaning Up Oil Sands
Setting Liners
Setting Cement Plugs
Bottlenecking for Cement Jobs
Removing Sections of Drillable Pipe
Water Shut-Off Tests
Sidetracking
Straightening Holes
Fishing Jobs
Enlarging Holes for Gravel Packing
Side Wall Sampling (by converting Scraper into Baker Wall Sampler)

Trends

Tanker Rates Bring Market Adjustments In Several Sections



MOST of the market changes of the past week were largely a reflection of the high tanker rates now in effect in all water transportation of crude oil and refinery products. Spot prices on light fuels were advanced at several eastern terminals, the increases being accounted for by the fact that it now costs from 1½ to 1¾ cents per gallon to transport petroleum products from the Gulf Coast to East Coast distributing points. While the statistical position of gasoline is not strong in the eastern part of the United States, it has been indicated that prices on that product will also advance before the end of the year if tanker rates continue at present levels.

CRUDE PRODUCTION *3,574,760 bbl. daily average — down 27,240 bbl. One year ago 3,855,330 bbl.*

CRUDE STOCKS *261,152,000 bbl. as of December 7—down 1,527,000 bbl. One year ago 232,016,000 bbl.*

GASOLINE STOCKS *81,234,000 bbl. as of December 14—up 172,000 bbl. One year ago 79,534,000 bbl.*

RESIDUAL FUEL-OIL STOCKS *104,105,000 bbl. as of December 14—down 1,248,000 bbl. One year ago 108,219,000 bbl.*

GAS OIL AND DISTILLATES *43,934,000 bbl. as of December 14—down 371,000 bbl. One year ago 36,005,000 bbl.*

REFINERY RUNS *3,495,000 bbl. daily week ended December 14 — up 35,000 bbl. One year ago 3,415,000 bbl.*

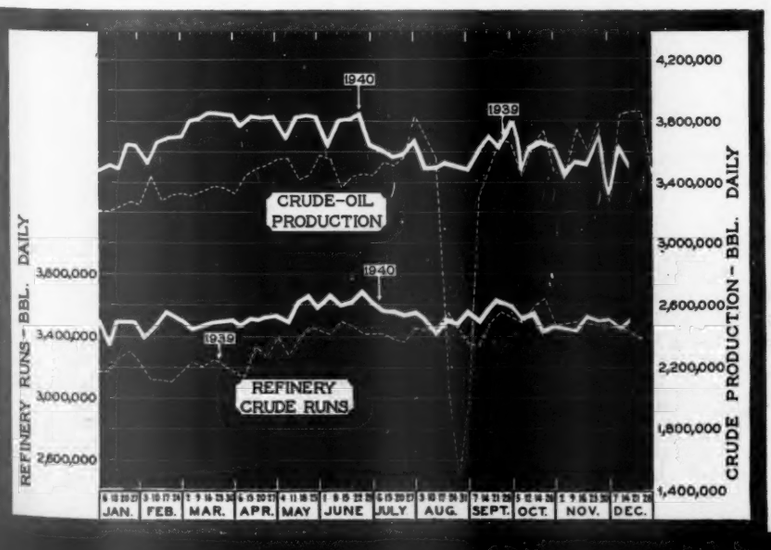
The current tanker-rate situation, which is discussed in detail in a special article appearing in this issue, was also a factor in the advance of 15 cents, effective Tuesday, in posted schedules for Pennsylvania Grade crude oil. While the Pennsylvania Grade market usually moves up and down, dependent on trends in lubricating oils, the present rates on water shipments have widened the eastern demand for gasoline, kerosene and fuel oils refined at plants operating with Pennsylvania Grade crude oil. The Pennsylvania increase is also in part due to enlarged export and domestic demands for some grades of Pennsylvania lubricants. The statistical position of these products has improved over the 90 days.

The tanker rates have also brought new demands for crudes produced in Illinois and parts of the Mid-Continent. One company is reported to be delivering 10,000 bbl. daily of Illinois crude to an East Coast refinery and another company is moving a like quantity of Oklahoma crude oil via pipe lines to a refinery located in the Philadelphia area. The savings in these pipe-line movements are indicated in the fact that the present pipe-line rate on the Illinois movement is 40 cents per barrel and 57 cents on Oklahoma shipments. The normal Oklahoma movement via pipe line to the Gulf Coast and tankers to the East Coast would now involve combination pipe line and tanker rates totaling 90 cents to $1 per barrel.

DAILY AVERAGE PRODUCTION FOR WEEK

	Dec. 14 1940	Bur. Mines Dec. est. of demand	December state allowables	Dec. 7, 1940
Arkansas	68,715	66,410	70,176	68,705
California	618,350	593,900	571,000	597,250
Eastern states	105,900	106,400	.....	105,700
Illinois	327,235	363,600	.....	332,045
Kansas	199,050	188,400	192,400	183,100
Louisiana	287,175	280,300	287,246	289,155
North Louisiana	*68,375*	.....	.....	*68,705*
Louisiana Gulf Coast	*218,800*	.....	.....	*220,450*
Michigan	42,450	47,100	44,000	45,125
Mississippi	13,355	13,900	.....	17,185
Nebraska	3,150	2,000	.....	3,250
New Mexico	103,500	100,600	104,000	103,420
Oklahoma	384,450	422,600	390,000	419,725
Rocky Mountain states	89,680	98,100	.....	92,740
Texas	1,331,750	1,277,000	1,316,660	1,344,600
East Texas	*375,175*	.....	.....	*374,840*
West Texas	*218,250*	.....	.....	*216,655*
North Central Texas	*137,875*	.....	.....	*144,850*
East Central Texas	*81,525*	.....	.....	*81,295*
Texas Panhandle	*76,525*	.....	.....	*80,760*
Texas Gulf Coast	*346,450*	.....	.....	*354,100*
Southwest Texas	*95,950*	.....	.....	*92,100*
Total United States	3,574,760	3,560,310	.....	3,602,000

The situation in Texas which is of more immediate importance than that of any other area, has shown little change over the past week. The reductions in crude-price schedules centering in the Corpus Christi area announced early in the month by independent refiners continue in effect but have not been met by the major buyers. Efforts to advance refinery and posted dealer prices for gasoline in Texas have not been successful. Indicative of the gasoline situation in the Southwest Texas area sales of third-grade material at refineries and distillate plants for less than 3 cents per gallon are reported. It has been indicated that some of the weak spots in the Texas situation will be corrected later through reductions in allowables.


REFINERY RUNS – BBL. DAILY
CRUDE PRODUCTION – BBL. DAILY
CRUDE-OIL PRODUCTION
REFINERY CRUDE RUNS
1940
1939
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.

War and Increased Demand Bring High Tanker Rates

By J. P. O'DONNELL

The swiftest rise of tanker rates in the experience of the oil industry reaching new peaks almost weekly is exerting unprecedented influence on the Gulf and Atlantic coastal products market. The record movement of products in coastwise trade, war's effect on tankers and rate trends are reviewed here.

Tanker receiving cargo of crude at oil dock at Corpus Christi, Tex.

NEW YORK, Dec. 16.—Several reasons have been advanced for the swift rise in Gulf-to-north-of-Hatteras tanker rates which has seen the clean-tanker rate for No. 2 heating oil rise from an early September low of 20 cents per barrel to an early December high of 80 cents, an increase of 300 per cent in 3 months. In early December this year, the No. 2 heating-oil rate was 7 cents above last year's record high attained almost 2 months later in the season.

The rise in rates this fall began later but has been swifter than in the corresponding period of 1939. Last year rates moved up early in September, dropped slightly in late October but jumped in late November and again just before the end of the year. This fall the rise did not begin until late September and became most rapid in November when the clean-tanker rate rose from 41 cents per barrel on the first of the month to 72 cents by the end of the month. A comparison between the rate of rise this fall with that of last fall is given in Fig. 1.

Among the reasons which have been cited in explanation of the higher rates are the greater increase in shipments than in available tonnage, the diversion of tankers from coastwise service and others. The first reason is supported by a review of Gulf-to-Atlantic-ports shipments and the United States tanker tonnage over recent years.

Shipments of crude oil and refined products from the Gulf to Atlantic ports reach their peak during the winter so that the coastwise tanker year should be regarded as extending from July to June, inclusive, instead of on the calendar basis, January to December. These shipments for the past 5 seasons, as reported by the United States Bureau of Mines, are given in Table 1.

TABLE 1—GULF-TO-ATLANTIC SHIPMENTS

Season—	Barrels
1935-36	318,556,000
1936-37	364,585,000
1937-38	372,135,000
1938-39	382,476,000
1939-40	425,065,000

The gross tonnage of the United States tanker fleet (including all tankers of 1,000 gross tons or over) as of June 30, the beginning of the coastwise shipping year, for each of these 5 years is given in Table 2. These statistics were obtained from the American Petroleum Institute's Petroleum Facts and Figures.

TABLE 2—UNITED STATES TANKER FLEET TONNAGE

Date—	Gross tonnage
June 30, 1935	2,418,932
June 30, 1936	2,489,725
June 30, 1937	2,575,199
June 30, 1938	2,759,642
June 30, 1939	2,796,536

Table 1 shows that Gulf-to-Atlantic-ports shipments increased from 318,556,000 bbl. in the 1935-36 season to 425,065,000 bbl. in the 1939-40 season. This was an increase of 33⅓ per cent in the 5-season period. In contrast to this gain, the United States tanker fleet increased in gross tonnage from 2,418,932 gross tons on June 30, 1935, to 2,796,536 gross tons on June 30, 1939, an increase of but 15 per cent. In the 1935-36 season the Gulf Coast-to-Atlantic Coast shipments averaged 132.5 bbl. per gross ton whereas in the 1939-40 season the average was up to 152 bbl.

In addition, a comparison of tanker rates with the volume of crude oil and refined products moved in this route reveals a relationship between the two. Therefore, the record demand for products indicated for the current season was, at the same time, an indication that higher tanker rates were probable. A comparison between tanker rates and the volume of shipments in the few years for which this information is obtainable show that a marked increase in the latter is accompanied by a marked increase in the former.

In the 1935-36 season when Gulf-to-Atlantic-ports shipments were 318,556,000 bbl., the high average market freight rate (dirty cargoes) for a single month was 32.5 cents per barrel. Shipments jumped to 364,588,000 bbl. in the 1936-37 season, an increase of 14.4 per cent, and the peak average monthly tanker rate jumped to 55.6 cents per barrel. In both the 1937-38 and 1938-39 seasons when the increases in movement were only 2 per cent and 2.7 per cent, respectively, the rates held without much fluctuations and the peaks were 36.1 cents and 24.8 cents respectively. In the 1939-40 season, shipments rose to 425,065,000 bbl. from 382,476,000 bbl. in the previous season, an increase of 11 per cent, and the peak average monthly rate for that season was 64.8 cents per barrel.

Available information is regarded as too incomplete to make this conclusion entirely reliable, however. Statistics on shipments from Gulf-to-Atlantic ports this season are available at this

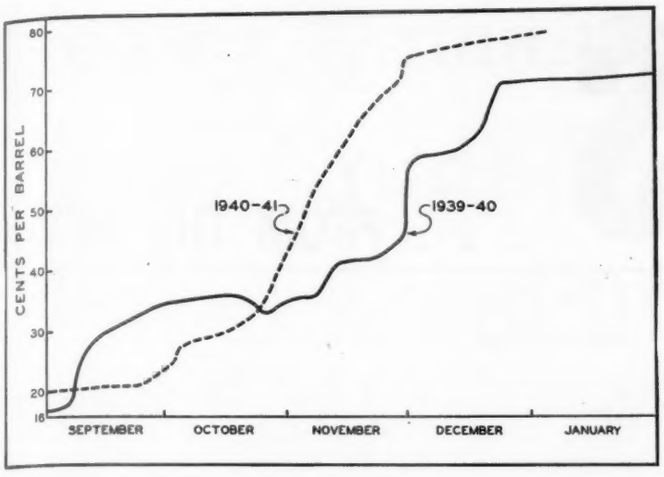


Fig. 1 (left)—Chart showing trend of coastwise clean-tanker rates

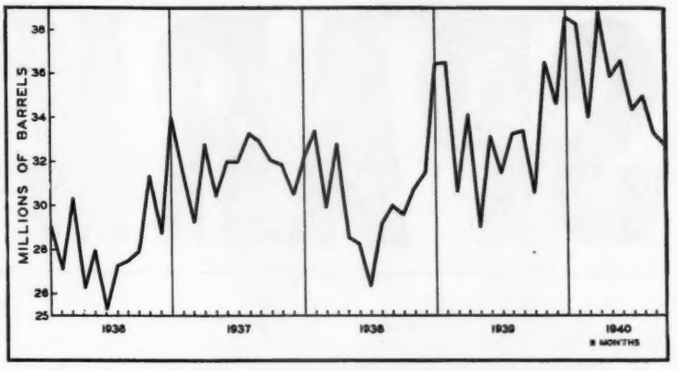


Fig. 2 (above)—Petroleum movement from the Gulf to East Coast. From Bureau of Mines data

TABLE 3—GULF-TO-ATLANTIC SHIPMENTS, 1935-40

Product—	Thousands of Barrels					
	1935	1936	1937	1938	1939	*1940
Crude oil	141,193	153,026	170,776	150,716	157,819	169,000
Gasoline	75,802	90,558	104,127	105,036	114,633	118,000
Kerosene	14,491	15,936	18,330	19,915	22,404	26,500
Fuel oil	62,321	80,431	84,343	86,174	100,147	117,000
Lubes	2,191	2,762	3,186	4,451	6,555	6,700
Others	126	201	263	494	485	500
Total	296,124	342,914	381,025	366,786	402,043	438,000

*Estimated.

time only for July, August and September of the current season. In these 3 months, shipments aggregated 100,949,000 bbl., an increase of less than 4 per cent from the corresponding 1939 period. However, the extremely tight tanker market that has prevailed through later months indicates that shipments then were heavy and the increase may be more marked than early statistics indicate.

Diversion From Coastwise Trade

Diversion of tankers from coastwise trade is also cited as a possible reason for the advance. Mentioned chiefly are the dozen high-speed, large-capacity tankers which were built for private companies and, at the request of the U. S. Maritime Commission, for the optional use of the U. S. Navy. Seven of these tankers have been requisitioned, four remain in private operation and the remaining one is still under construction. Because of their nearly 40 per cent greater capacity and 25 per cent greater speed than other average recently built tankers, these vessels could transport almost twice as much oil in a 6-months season of continuous service. Had these tankers been retained in coastwise service, it is contended, the rise in rates may have been either lessened or delayed.

Another possible reason which is also cited is the transfer of a number of American flag tankers to foreign registry. During the first year of the war, a total of 28 tankers with an aggregate deadweight tonnage of 301,073 tons were transferred, 75 per cent of them to Panamanian registry. These boats were chiefly old, ranging from 20 to 35 years, and small, ranging from 4,000 to 7,000 gross tons.

A somewhat similar reason which has been cited is the chartering by Great Britain of the tanker fleets of allied nations, particularly that of Norway, the world's third largest fleet. Only those of the British Empire and the United States were larger. In addition, tankers serving the United Kingdom at present travel in convoys in which the faster ships are retarded to the pace of the slowest vessels, thus requiring a greater amount of tonnage to perform the same service. The rate of tanker losses due to submarine warfare, incidentally, has not increased appreciably from the average of five per month in the first year of the war, it is reported. On this basis the total tanker losses during the war so far approximate 80.

Increased imports by the United States indicate that there are substantially more tankers in this service than before. United States imports in the first 9 months of 1940 were 34 per cent greater than in the same months of 1939. However, the bulk of this increase in imports, 21,000,000 bbl., is in refined products, particularly fuel oil, up 11,900,000 bbl., so that shipments as well as tankers are removed from coastwise service.

A summary of these possible factors indicates that increase of Gulf-to-Atlantic Coast shipments, particularly of fuel oil and kerosene, constitutes the principal reason for the advances in rates. While shipments of both crude oil and refined products have increased in the last 5 years as is shown in Fig. 2, the gain in shipments of kerosene and fuel oil has been most pronounced as is shown in Table 3. It will be noted that while shipments of crude oil have risen 20 per cent and gasoline, 56 per cent, those of kerosene have advanced 83 per cent and fuel oil, 88 per cent.

NEXT WEEK—The International Number

Including—

- **A 30 by 40 in., four-color oil map of South America, inserted in mail-subscribers' copies. Map information includes oil fields, refineries, pipe lines, airlines and Pan-American highway system.**
- **Spanish-English section describing latest developments in operating practices.**
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La Proxima Semana—El Numero Internacional

Que Comprende—

- **Un mapa de 30 by 40 pulgadas, a cuatro colores, de la América del Sur, que se insertará en las copias que van a los subsriptores, por correo. La información del mapa incluye campos petrolíferos, refinerías, líneas de tubería, líneas aéreas y sistema de carretera panamericana.**
- **Sección en inglés y español, que describe los más recientes desarrollos en prácticas de trabajo.**
- **Mapa petrolero de Europa y sección del Mediterráneo, especialmente preparado para mostrar los efectos de 16 meses de guerra. Discusión autorizada relativa a lo que la guerra significa en relación con la industria del petróleo.**
- **Informes sobre los desarrollos petrolíferos en todos países.**
- **Artículos técnicos que describen los métodos modernos en la industria del petróleo.**

SPARKS . . . FROM THE NEWS

WORKS BOTH WAYS: Inadequate oil supplies hampered Italy's invasion of Greece. Obviously this deficiency is just as serious in retreat. It takes just as much fuel to back up as to go ahead.

THE DRILLER'S DREAM: Kansas operators now drill into collapsed caves filled with shale and clay. If they could only find a cave that had not collapsed and was filled with oil!

CURRENT MYSTERY: One of the mysteries of the Texas situation is why some buyers nominate more crude in the face of current market conditions.

NO CURE-ALL: A rubber company announces a new nozzle for gasoline hose made synthetically from petroleum. It will do everything but increase the price of gasoline to the proper level.

TIMES CHANGE: Within a month of discovery, 14 tests are scheduled for the Wood County, Texas, Woodbine sand play. It took operators 3 months to admit that the Joiner pool was an oil field.

PREPAREDNESS: With new producing horizons and wildcat discoveries nearly 75 miles from the nearest large fields, Kansas operators are getting ready for record-breaking activity. All they need is a market.

HOPEFUL: Washington reports indicate that an entirely new approach to business regulation, including the scrapping of the archaic antitrust laws, may come out of the T.N.E.C. investigations. It may develop that the months spent by the oil industry in presenting its case last year were not time wasted.

MERE ROUTINE: Last week nine 10,000-ft. wells were completed, two of them over 11,000 ft., and two others over 13,000 ft. None rated any special comment.

STILL AT IT: The search for more large fields in the Illinois basin to supply next year's demands continues apace. Right now the search centers in the eastern part of the area.

QUESTION: A Southwest Texas operator says the tanker rate for moving a barrel of crude oil from Corpus Christi to the East Coast is the same as he is being paid for his oil at the well. He wants to know why.

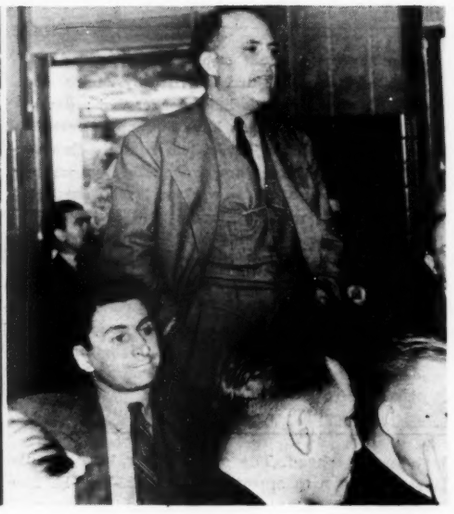
IMPORTANT: A government report says the rate of increase in service-station building is one-third what it was. That should interest refiners who have been guaranteeing operating profits at stations.

MEETING OF MINDS: The Government is said to be considering the construction of an interior pipe-line system as a defense measure while certain states and railroads are doing all they can to stop the building of lines by oil companies. A meeting of minds is needed here.

ENGINEERING AGE: Oil men of 20 years ago talked about wildcats, bullwheels, straightrun gasoline and water-white kerosene—now they are identified by their discussion of multiple-zone production tubing, polymerization, pressure maintenance and inhibitors. Incidentally the price of gasoline at refineries is now about one-fourth what it was 2 decades ago.

***FIRE RAVAGES TEXAS REFINERY:** A 46-hour oil conflagration which wreaked a $250,000 damage to the Southport Petroleum Co.'s refinery at Texas City, Tex., was extinguished Sunday. The view below shows a night scene of the fire after three 80,000-bbl. storage tanks containing gasoline and crude oil were ignited by lightning*

Heavy Demand for Texas Crude Despite Market Conditions



Oil men snapped during Austin hearing. Above, O. D. Robinson, president, Republic Oil Refining Co., New York. At extreme left, Hines Baker, attorney for Humble Oil & Refining Co., is speaking from the floor. At left, Matson Dixon, president, Southern Minerals Corp., Corpus Christi, voices an opinion

By NEIL WILLIAMS

HOUSTON, Tex., Dec. 16.—Despite the disturbing conditions confronting the Texas oil industry, crude-oil purchasers and producers in the state do not want further reductions in allowable production at this time, and, in this, place the blame for their present problems not so much upon the existence of too much oil as upon other factors more far reaching in their scope.

This was the conclusion formed at the emergency state-wide proration hearing at Austin, December 11, when oil-purchasing companies almost unanimously reaffirmed previous nominations for crude to meet their requirements for December and January.

Some purchasing companies, whose nominations for this month have been in excess of actual purchases and allowable production granted their sources of supply, requested that their nominations be cut to the allowable production assigned them. Only a very few asked that they be relieved of crude now being purchased, and in these instances the amount of oil involved, all of which was high-gravity crude, was comparatively small.

Quite a few purchasers and producers, among them some of the major companies, sought increased allowables. These, in most instances, claimed their stocks were too low for desirable operating conditions. Several refiners and other buyers stated they were in pressing need for additional oil, and with a few smaller refiners it was a case of getting immediate relief or shutting down their plants.

Humble Oil & Refining Co.'s petition that its allowables be maintained at existing levels invoked questioning by Jerry Sadler, member of the commission, of Hines Baker, Humble's spokesman, as to whether he thought production of Texas was too high.

Mr. Baker replied that on the basis of the Bureau of Mines estimate of market demand, which is somewhat under the current production of the state, production of the state is too high. Mr. Sadler was not satisfied with that answer and insisted on Mr. Baker's opinion without consideration of the bureau's figures on demand. This opinion, however, was not forthcoming, but Mr. Baker admitted the company needed the oil.

Similar questioning was directed by Mr. Sadler to J. Sayles Leach, vice president, the Texas Co., although the latter company was one of those asking to be relieved of some of its high-gravity-oil purchases. Mr. Leach said his company was buying about 7,000 bbl. more daily than it needed, most of this oil being in East Texas. Mr. Sadler asked Mr. Leach if his company wanted to release this oil that it might run Louisiana oil. Mr. Leach informed Mr. Sadler, however, that the Texas Co. also had advocated reduced runs from Louisiana. This company asked increased allowables for heavy crudes from certain Gulf Coast fields to the extent that its total allowable would not be decreased by release of the light oil purchases.

Hearing Held to Survey Demand

The hearing, called following posting of crude-price reductions by Republic Oil Refining Co. and other important independent buyers in various South Texas and Southwest Texas fields, was held to resurvey the market demand for Texas crude. At a state-wide hearing preceding the issuance by the Railroad Commission of the December allowable order, nominations for crude during December totaled 1,756,811 bbl. daily. Gross daily allowable then was set at 1,754,726 bbl., but 9 shutdown days were ordered, which, it was estimated, would have brought the net daily average allowable down close to the Bureau of Mines estimate of market demand of 1,277,000 bbl. daily. Since, increasing volumes of crude have been offered at the Gulf Coast at prices substantially below prevailing posted market prices at the Gulf, and with the subsequent reductions in posted prices by various independent-company buyers, question was raised as to the correctness of previous market-demand determinations.

Although, as this is written, no revised allowable order has been issued, it was indicated by E. O. Thompson, member of the commission, and acting chairman at the hearing in the absence of Lon Smith, that a reduction in daily average production of approximately 60,000 bbl. would be in order to bring the allowable in line with the Bureau of Mines' estimate of demand, to which estimate Colonel Thompson said Texas production would be limited. He stated that Texas at that time was producing more than 36,000 bbl. in excess of the Bureau of Mines' figures, and that daily production of new wells to be completed during the month would amount to an additional 15,000 bbl. daily.

Seek Solution to Problems

Efforts to get the Railroad Commission to give consideration to solution of the problems now facing many of the independent refiners and producers on the Gulf Coast, particularly in the Corpus Christi district, in the way of increased transportation costs to the East Coast, and competition of unprorated distillate wells and recycling plants failed to get far as members of the commission pointed out that their authority was limited to prevention of waste in the production and handling of oil.

However, Matson Nixon, president of Southern Minerals Corp., one of the leading independent producers and purchasers of crude in the Corpus Christi district, discussed some of the conditions. He said that a "bad situation" exists on the Gulf Coast. Not only have independent producers and refiners on the Gulf Coast lost most of their export markets, he explained, but within the last several months possible domestic markets on the Atlantic seaboard are being cut off by scarcity of tankers and greatly increased transportation costs. Tanker rates lately, he said, had been boosted more than 150 per cent, and so far the market on the East Coast had not been advanced sufficiently to offset this.

Mr. Nixon said the increasing distillate produc-

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Process For Conversion Of Pennsylvania Bright Stock Into Neutrals

By C. R. WAGNER
Chief Chemist, Pure Oil Co.*

Pennsylvania bright stock is now quoted at 14½ cents a gallon and 200-viscosity neutral oil at 23½ cents. There is little wonder that refiners in the Appalachian area have become interested in converting bright stocks into neutrals. Inventories of bright stocks are abnormally high while those of neutrals are at working levels. The accompanying paper describes a tried and patented method for converting bright stocks into neutrals by simple blending and distillation under controlled conditions.

The increased demand for lighter motor oils is a reflection of trends in automotive-engine design in which closer clearances, higher speeds demand the use of lower-viscosity lubricants, and this trend promises to continue.

FOR some few years the trend in automotive lubrication practice has been toward progressively lighter, i.e., lower-viscosity, lubricants, arousing an increased demand for neutrals and a correspondingly decreased demand for bright stocks for blending purposes. This situation is of peculiar significance to the refiner of Pennsylvania crudes. The proportion of bright stock to neutral in Pennsylvania crude is approximately 60 to 40, whereas, as a rough approximation, the average automotive lube-oil requirement today could be met by a blend of just the reverse proportion, i.e., 40 parts bright stock to 60 parts neutral. Lube stocks of whatever viscosity are by far the most valuable products obtainable from the limited available supply of Pennsylvania crude. Consequently, the Pennsylvania refiner is forced by economic necessity to refine for maximum yield of both bright stock and neutrals—it is not possible to follow the practice, common in the Mid-Continent field, of obtaining extra slop-wax distillate (neutral stock) by running crude to a fuel oil or cracking stock residuum.

The continual forcing of Pennsylvania bright stock onto a market limited in demand to the available supply of Pennsylvania neutral has resulted in a marked decline in the price of bright stock as compared to the neutral. In the winter the balance of demand shifts even farther towards the neutrals and there is a sharp increase in the differentials. This differential offers an attractive opportunity for a process for the conversion of lower-priced bright stock to neutral.

Details of Process and Yields

Fifteen-pour bright stock is charged to a shell still. This is blended with 10 per cent light oil such as kerosene. An alternative is to charge bright-stock solution. Either procedure is satisfactory, the choice depending largely on whether it is desired to convert bright stock from storage or current production. The advantage of processing solution lies in the elimination of blending with light oil and the heat saving due to heating the bright stock only once. The still is brought up to temperature rapidly in the case of processing bright stock and conventionally when processing solution until the solution is denuded. Liberal steam is introduced. The overhead stream is cut first to naphtha storage, then gas oil and, when the stream viscosity reaches 35-40 viscosity at 100 it is cut to 180 stock storage. At this point the still temperature is approximately 525°-550° F. The supply of steam is then cut back sharply and rapid firing is maintained. The still temperature reaches approximately 620° F. quickly and the viscosity of the overhead is 90-100 at 100. Steam and firing are then controlled to maintain the viscosity of the stream between 90 and 120 at 100° F. The operation is continued until about 93-96 per cent of the original bright-stock charge is taken overhead. The still temperature at this time has risen to approximately 700°-720° F. The average cycle time from charge to charge will run about 60 hours. The bottoms can be segregated until enough is accumulated and then mixed with a light oil and reprocessed in a similar manner to the original bright-stock conversion operation for the production of additional 180 stock or it can be put to fuel oil.

Yields in this operation on the basis of bright stock charged are as follows:

	Per cent
180 stock	95.0
Bottoms	4.0
Loss	1.0

QUALITY OF PRODUCTS

	180 stock	Bottoms
Gravity	32.0-32.5	16-17
Flash	110-115	660-680
Fire	140-150	735-745
Viscosity at 100	95-105	
Viscosity at 210		720-760
Pour	20-25	40-45
Color	7-7+	+8 DDD

The 180 stock is then blended with normal Pennsylvania pressed oil or 85 stock or both. The proportion of each component is more or less immaterial although it is preferable not to use more than 30 per cent of 180 stock from bright-stock conversion in the mix. The blend is then reduced in the normal manner for reducing pressed oil to 180 distillate.

Ultimate yields on the basis of 180 stock from bright stock converted are as follows:

180 distillate, per cent	112

The 112 per cent recovery is due to the ability of the process to absorb heavy ends of gas oil.

The 180 distillate produced from the mix reduced has the following specifications:

Gravity	30.0-30.5
Flash	415-425
Fire	460-480
Viscosity at 100	180-185
Pour	25-30
Color	5+-6+ NPA

The 180 distillate is finished off by conventional treatment to the desired finished 180 neutral color.

OVERALL YIELDS 180 NEUTRAL FROM BRIGHT STOCK

	Per cent
180 neutral	100.0
Fuel oil*	3.9
Loss	2.0
Total	105.9

*Assuming the bottoms are not reprocessed for additional 180 neutral.

Costs and Economics

The outstanding advantages of the process are two in number. In the first place it calls for absolutely no investment outlay in new equipment. Adequate shell-still capacity is available at all Pennsylvania refineries. Further, the technique of operation and control is extremely simple, and to a considerable degree flexible, permitting complete mastery by the average stillman after brief instruction. In the absence of investment charge the refiner can easily afford to start and stop the operation on short notice. . . .

The second advantage of this process lies in the fact that relatively large proportions of nonviscous neutral are carried into valuable 180-neutral oil instead of being sold as gas oil or nonviscous neutral. The reason for this lies in the relatively high viscosity of the bright-stock distillate produced in the cracking of bright stock. As will be observed, this distillate contains from 10 to 15 per cent of gas oil and lighter materials. On redistillation either in a rerun tube still or in the old-fashioned shell-still rerun operation these light fractions are replaced by the heavier parts of the nonviscous neutral fraction blended with the bright-stock distillate before rerunning. It is due to this phenomenon that the refiner is able to secure yields of approximately 100 gal. of 180-viscous neutral per 100 gal. of bright stock charged to the cracking operation.

The overall operating cost per gallon of 180 neutral from bright stock is .0325 cent per gallon. This includes extra filtering cost due to the 180 distillate being darker than normal 180 distillate and the extra cost involved because of the higher pour material produced. Details are as follows:

(Basis, 1 bbl. bright stock charged)

Extra paraflow for pour adjustment	$.3150
Converting bright stock	.2100
Reducing 180 stock	.1021
Treating and finishing	.7371
Total	$1.3642
Operating cost per gallon 180 produced	.0325

The actual profit to be made by converting bright stock to 180 neutral is of course subject to the differential between the value of bright stock and the value of 180 neutral. This differential is also affected by the market value of the gas oil and fuel oil produced in the process. The following formula can be used to determine the cost of 180 neutral produced by this process for any value of bright stock, gas oil and fuel oil.

Cost/gal. neutral = $.0325 + value bright stock + .059 value gas oil — .039 value fuel oil

Market value used in above formula is market value per gallon.

OPERATING COST OF BRIGHT-STOCK CONVERSION
(All figures are per barrel of bright stock charged to the operation)

	Cracking	Reduction	Finishing	Paraflow	Total
Labor	$.0162	$.0167	$.0360		$.0689
Steam	.0902	.0090	.0135		.1127
Fuel	.0620	.0231			.0851
Paraflow				$.3150	.3150
Miscellaneous	.0416	.0533	.0720		.1669
Clay			.6156		.6156
Total	$.2100	$.1021	$.7371	$.3150	$1.3642

Miscellaneous item includes minor utilities, maintenance and overhead costs; therefore this summary includes both fixed and variable costs.

Labor is estimated according to average experience for shell and tube stills for 9 months of 1940. No additional labor was necessary for this operation.

Fuel is based on a cost per gallon of $.02137.

*Delivered before manufacturers meetings of N.P.A. at Bradford, Oil City, and Butler, Pa., Dec. 11-13.

Illinois Activity Concentrated On Eastern Side of State

By HARRY F. SIMONS

CARMI, Ill., Dec. 17.—While Illinois activity generally has declined materially, there is one area in the state which has shown an increase in recent months. It is the area centering around White County and including Wabash, Edwards, Gallatin, Franklin, Hamilton and the southern part of Wayne counties. Development in the area generally is more competitive than any other place in the state since this was one of the last sectors to be leased in the state and consequently there are few solid blocks.

As late as 1938 some of the now-producing properties were as yet unleased and it wasn't until the fall of 1939 that the lease play really got hot. In the meantime, many major companies which had looked with a jaundiced eye on the first lease play which led to the discovery of large-scale production in Marion, Clay and Fayette counties, came into the southeastern territory and purchased lease blocks. Instead of the territory being dominated by Carter Oil Co., Pure Oil Co., Texas Co., Magnolia Petroleum Co., Ohio Oil Co., and Shell Oil Co., Inc., many of the properties are owned by Continental Oil Co., Superior Oil Co., Sun Oil Co., Exchange Oil Co. (Sinclair), Seaboard Oil Co., Skelly Oil Co. and a host of independent operators.

Two factors discouraged development in White and adjacent counties during the early days of the Illinois revival. The first was the fact that the northern part of White County is the deepest part of the Illinois basin and the second is the sharp rise of formations to the south and east due to the uplift which forms the rim of the basin. Some believed this latter factor to be unfavorable while others considered it very favorable. No prospecting method gave any better than fair results.

Some indication of the rate of rise is obtained by comparing the depth of the McClosky in the Burnt Prairie pool (Township 3s, Range 9e) and in the Stokes pool (Township 6s, Range 8e), both in White County. In the former the approximate depth is 3,430 ft. while in the latter it is 3,080 ft. These two pools are about 15 miles apart. In the Thompsonville pool, in 7s-4e, Franklin County, the McClosky is found at approximately 3,110 ft.

Hoped for Larger Pools

Original hopes for the area were for large pools but development has proven otherwise, most of the fields being small. Some of the anticlines in the area are quite large, one being the largest in the state, but so far oil has been found in rather small structures on these larger features. Each time a new discovery well is drilled, geologists rather hopefully say it means a big pool, only to have a few dry holes limit it in a very short time. A new pool may later be found a comparatively short distance away.

The small size of the fields is partly compensated for by the number of producing horizons in the area. One field, East Calvin, in White County, has six producing horizons which are currently being developed. With the exception of the McClosky, all of the producing horizons in East Calvin are in the Chester series and include the Tar Springs, Cypress, Benoist, Paint Creek stray, and Aux Vases sands. The Griffin pool produces from two Pennsylvanian sands, three Chester sands and the McClosky lime. Other fields have two, three and four producing zones under development.

First production in the area was in the Aden pool in southwestern Wayne County in the summer of 1938. This field was later extended into Hamilton County. White, Gallatin, and Wabash counties broke into the discovery column in the summer of 1939 and Edwards County followed in the fall of that year.

While development in the above counties continued and increased during the latter part of 1939 and early 1940, it was held back to some extent by the lack of suitable outlets and the fact that the Salem pool in Marion County was definitely booming. In 1940 Hamilton County got two oil fields while Franklin County developed the farthest south McClosky production at Thompsonville. White, Wabash, Wayne, and Edwards counties continued to add new fields. Table 1 shows the discovery wells, locations, dates of discovery, producing formations and initial production of the various fields.

Other Producing Zones

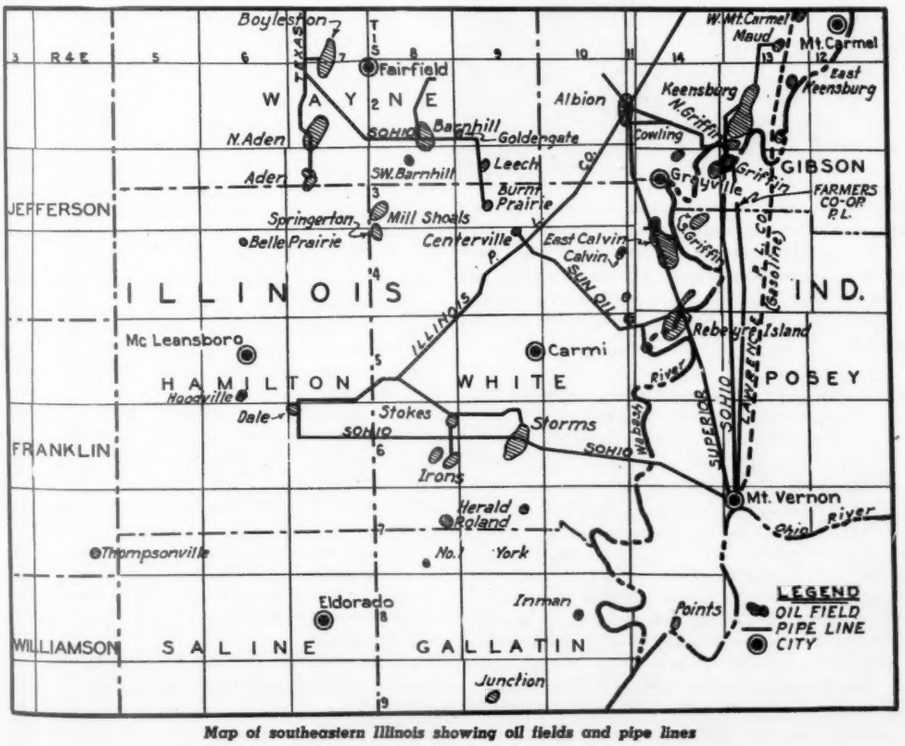
Just as important as the new fields was the discovery of other producing zones in the fields already on production. In some cases, the discovery well in the field was proven to be of relative unimportance, while the testing of some other formation showed where the real possibilities lay. The Hoodville pool in Hamilton County is an excellent example, the discovery well being in the McClosky, but all later development being in the Bethel. There are now 24 Bethel wells and 1 McClosky well in the field.

Latest discovery in the area is the yet-unnamed pool around the Carter Oil Co. 1 York, SE SE SW 33-7s-8e, Gallatin County. This well obtained production in the Palestine sand but was drilled deeper to test the lower horizons and was then plugged back. The only other place the Palestine has been productive is in the Keensburg field in Wabash County. Some indications of the maximum size of this new field may be obtained from the fact that a dry hole is located about 3½ miles to the southwest and another about 1¼ mile to the northeast.

Production in the area has shot up as the result of the recent development as can be seen from Table 2. The table also shows that many of the fields in the area are increasing their production due to rapid development. It also reflects the activity that has taken place in these counties during this year.

An indication of the increase in activity is given by the oil completions in the seven counties comprising the area for November 1939, and the same month a year later. A year ago there were 57 oil wells completed for an initial of 11,747 bbl. and during the month just ended there were 130 oil wells completed for an initial of 25,124 bbl. White County has risen from 19 oil completions per month to 63; and Hamilton, which showed no oil completions a year ago, showed 15 during the

(Continued on Page 24)



Map of southeastern Illinois showing oil fields and pipe lines

Law to Facilitate Secondary Recovery Will Be Sought

By H. STANLEY NORMAN

LEGISLATION enabling operators to consolidate interests in properties so that secondary recovery may be applied on a practical basis is to be urged before the Oklahoma Legislature by the Oklahoma Stripper Well Association. Decision to press for demolition of the chief barrier to use of repressuring was reached at the annual meeting of the association held in Tulsa, December 13 and 14.

Unanimous opposition of the stripper-well association was added to the growing list of organizations deploring any expansion of federal control. A minority report from the resolutions' committee inviting modified federal supervision in producing states now lacking conservation statutes was unacceptable to the general association.

In a resolution directed at Cordell Hull, secretary of state, the association urged invocation of the "escape clause" in the Venezuela trade agreement which has permitted an expansion of petroleum imports.

Additional legislation is to be asked under which the Corporation Commission would be given authority to order payment for all Oklahoma oil on the basis of 100 per cent, less only the actual reductions for basic sediment and water.

W. A. Goforth, Tulsa (circle), president of the Valley Osage Oil Co., and reelected president of the Oklahoma Stripper Well Association. Speakers' table at the luncheon conference, above, Howard J. Whitehill, Tulsa, president of Whitehill Oil Corp., and secretary-treasurer of the association; Mr. Goforth; Earl Foster, Oklahoma City, conservation attorney for the Oklahoma Corporation Commission; Roy M. Johnson, Ardmore, vice president of the association; R. L. Gordon, Bartlesville, chief counsel for Indian Territory Illuminating Oil Co., and a member of the association's executive committee; George W. Strawn, Ardmore, independent producer and D. G. Powell, Tulsa, executive manager of the association

While the fight for legislation to permit consolidation of properties for secondary recovery is to be conducted specifically before the Oklahoma Legislature, members of the association with interests in other states consider the step vital to future practices throughout the industry.

William A. Goforth, of Tulsa, president of the Valley Osage Oil Co., was reelected for a third term as the association's president. David G. Powell, of Tulsa, general manager of the association, was given the additional title of executive vice president.

Additional vice presidents are Charles E. Clowe, Ardmore; H. R. Johnston, Tulsa; Dave Morgan, Blackwell; L. W. Winkler, Duncan, and Howard J. Whitehill, Tulsa, who was reelected secretary and treasurer of the association.

The executive committee, heretofore composed of 10 and the four ex officio officers, was enlarged to 20, and the board besides the officers comprises John B. Steel, Curtis F. Bryan, S. C. Canary, John H. Leavell, H. Gussman, all of Tulsa; C. C. Harmon and J. Wood Glass of Nowata; Clyde Fowler, Bartlesville; L. B. Jackson, Sapulpa; John H. Rebold, Okmulgee; Charles F. Balph, Shawnee; Roy M. Johnson and Tide Cox of Ardmore.

The directorate also contains these:

J. F. Darby, H. Clyde Pape, H. F. Worley, Dr. H. C. Weber, J. R. McGraw, all of Tulsa; R. L. Gordon and C. E. Burlingame, Bartlesville; Charles E. Knox, Enid; W. W. Warner, Nowata; Robert A. Hefner, jr., and Frank M. Porter of Oklahoma City; R. R. Kirchner, Bristow; J. B. Milam, Chelsea; George Bradfield and Charles F. Balph of Shawnee; J. S. Ewing, Healdton; S. C. Granger and George Pace, both of Duncan; Harold B. Fell, Wirt Franklin, Earl Q. Gray, Will H. Smith and George W. Strawn, all of Ardmore; J. D. Roberts, Okmulgee; O. V. Beck, Nocona; J. S. Bridwell, Wichita Falls, and Jake L. Hamon, Dallas, Tex.

Impracticality of using secondary-recovery methods on a broad scale unless consolidation of interests can be accomplished through legislation was reviewed by Mr. Gordon, of Bartlesville, who is chief counsel for Indian Territory Illuminating Oil Co. In his paper on "Legislation Authorizing Unitization of Royalty Interests for Secondary Recovery."

Nearly 2 years of intensive engineering study have been devoted to the Wilcox zone in the Oklahoma City field and the conclusions reached are these:

1. That repressuring by injection of gas is the only secondary-recovery operation which would be practical for that zone.

2. That a gas repressuring operation can not be efficiently and profitably carried on within limits of any single lease.

3. That unitization of separately owned leases into a unit of sufficient size to justify the conduct of gas repressuring operation is a prerequisite to the recovery of the vast amount of oil which will remain in that reservoir after primary operations have become unprofitable.

Mr. Gordon said that Norman E. Maxwell, secondary recovery engineer for I.T.I.O., is of the opinion that 640 acres constitutes the minimum unit within which a reasonably efficient and profitable secondary-recovery operation could be projected in the Wilcox zone.

Nowata Shows Potentialities

J. Wood Glass, attorney and independent producer from Nowata, Okla., reviewed the history of repressuring in Nowata County and presented physical results which indicate the potentialities of secondary recovery. He warned that not all fields are amenable to repressuring and cited an instance of one tract producing 6 bbl. of oil daily upon which $100,000 was spent on a flooding program. After returns on the injections started the production rose to 7 bbl. daily.

An 80-acre lease of Sinclair Prairie Oil Co. in the Childers pool was presented as an example of profitable repressuring. When the project was started in 1932, production for the year was 3,000 bbl. In 1935 the 80 acres produced 58,614 bbl.; in 1936, production totaled 44,819 bbl. and the decline was gradual to 35,850 bbl. in 1939.

Recovery from a tract of 157.18 acres operated by Forest Producing Corp. has totaled 6,574 bbl. per acre since 1935 when a water-flooding project was started.

Mr. Glass said that Nowata County produced 2,254,340 bbl. of crude in 1934, 3,000,000 bbl. in 1936, more than 4,000,000 bbl. in 1938 and 4,351,122 bbl. in 1939. He said that 80 per cent of the increase could be attributed to water-flooding operations.

A petroleum market structure based on a profitable posting for crude was advocated by George W. Strawn of Ardmore, who declared that a price below cost of production constitutes waste of the first magnitude.

The association adopted a resolution urging Congress to limit petroleum imports to an amount not in excess of 4.5 per cent of the domestic demand, including exports.

Officers of the Petroleum Electric Power Association: H. E. Roberts, Empire District Electric Co., reelected vice president; E. L. Robinson, Gulf States Utilities Co., elected president for 1941, and E. A. Armstrong, Public Service Co. of Northern Illinois, retiring president

Power Club Told Industry Ready for Any Emergency

BATON ROUGE, La., Dec. 16.—Members of the Petroleum Electric Power Association in their twelfth annual conference held here December 12-13, were told the electric-power industry today is prepared to meet any demands of the oil industry that defense preparations might require. This, K. K. Kreamer of Houston Lighting & Power Co., Houston, Tex., said was because "preparation and preparedness are two words which the power companies know well—long-range planning is an inherent characteristic of the successful utility system."

He then went on to point out that in 1917 at the outbreak of the World War, the installed capacity of utility companies was about 9,000,000 kw. Now, the total generating capacity is approximately 42,000,000 kw., of which 87 per cent is privately owned and the remaining 13 per cent by municipal and federal authorities. This capacity is generated 72 per cent by steam plants and 28 per cent by water power, he said. Regarding the location and availability of this capacity, he stated that at present the excess installed capacity over the sum of the peak loads in the industrial areas is well over 40 per cent. This, he said, means that the power industry will be able not only to handle defense requirements, but also will be able to maintain its regular peacetime services.

To the petroleum industry, he said this meant that it could open the throttle with the assurance an adequate power supply was available; that rapid and large-scale expansion could be made on short notice and with a minimum of preparation.

At the conclusion of the 2-day meeting E. L. Robinson of Gulf States Utilities Co., Beaumont, Tex., was elected president of the group to succeed E. A. Armstrong of Public Service Co. of Northern Illinois, Chicago. Other officers elected were H. E. Roberts of Empire District Electric Co., Joplin, Mo., reelected vice president; and K. K. Kreamer, secretary-treasurer to succeed G. H. Weckel of Kansas Gas & Electric Co., Wichita, Kans. New directors named for 1941 were O. W. Jones of Central Power & Light Co., Corpus Christi, Tex.; W. H. Stueve of Oklahoma Gas & Electric Co., Oklahoma City, Okla.; J. E. Elliott of Southwestern Gas & Electric Co., Shreveport, La.; B. E. Lowe of Southwestern Light & Power Co., Chickasha, Okla.; Louis Blalock of Texas Power & Light Co., Dallas, Tex., and Mr. Kreamer. The meeting was attended by about 100 delegates.

In the opening session an outstanding paper was delivered by W. A. Whitaker of Standard Oil Co. of Louisiana, in which he discussed the selection of prime movers at the company's Baton Rouge refinery. In this 100,000-bbl.-capacity refinery he pointed out that

Directors elected for 1941: Front row, O. W. Jones, Central Power & Light; B. E. Lowe, Southwestern Light & Power Co., and Louis Blalock, Texas Power & Light Co. Back row, J. E. Elliott, Southwestern Gas & Electric Co.; K. K. Kreamer, Houston Light & Power Co., also elected as secretary and treasurer, and W. H. Stueve, Oklahoma Gas & Electric Co.

1,000 reciprocating pumps (with about 24,000 hp. on the liquid end) and 650 reciprocating pumps (with 35,000 hp. at the drivers) were in use. For driving this and other pumping and compression equipment, steam consumption varying from 750,000 to 925,000 lb. per hour and electric-power consumption varying from 11,500 to 17,000 kw. were required. He then discussed utility supplies available for prime movers, including low-pressure steam, live steam, electric power, natural gas, oil products, and compressed air.

Discussing factors affecting selection of prime movers he pointed out that the following 10 items should be considered:

First cost, cost of utility connections, operating costs, maintenance costs, reliability of driver and of utility supply, space and housing requirements, presence of flammable gases, simplicity of operation, and adaptability for other services influence selections.

In the Thursday afternoon session, following Mr. Kreamer's presentation, W. R. Bell of Gulf States Utilities Co., Baton Rouge, delivered a paper on its Baton Rouge generating station. This plant he said was unlike the ordinary generating station where 70 per cent of the energy burned as fuel is lost in the steam exhausted from the turbine; it was designed to use that waste by selling it for utilization in industrial purposes. He then described the effect of this unusual provision on the plant's growth to its present capacity of 2,800,000 lb. of steam per hour and 88,500 kw. electric energy.

Other papers and subjects covered at the meeting included a paper by J. E. Moody, power engineer for Southwestern Gas & Electric Co., Shreveport, La., on "East Texas Production." W. H. Stueve spoke on "High-Speed Gas Engines," and A. M. Young of Central Illinois Public Service Co. discussed "Illinois Field Methods." H. E. Dralle, of the industry engineering department of Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pa., spoke on new methods and equipment. At the association dinner on Thursday evening A. B. Paterson, president of New Orleans Public Service Co., was principal speaker.

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Mississippi Geological Society Conducts Annual Field Trip

JACKSON, Miss.—Over the week end of December 6 an extensive field trip was conducted by the Mississippi Geological Society in northern Alabama. The success of this trip was largely due to the leadership of Dr. Russel S. Poor, of Birmingham-Southern College, who conducted the caravan of some 40 cars and led the discussion by the use of a loud speaker attached to the leading car. He was assisted by Arthur Blair, chief geologist of the Tennessee Coal & Iron Co., and Robert Ross of the Tennessee Valley Authority. Geologists from Oklahoma, Texas, Louisiana, Arkansas, Mississippi, Alabama, Tennessee, Illinois, West Virginia, Florida and Georgia attended the field trip. They were given the opportunity to see the iron deposits in the vicinity of the Ishkooda mine No. 11 and to study the entire stratigraphic section from the Conasauga limestone of the Cambrian system up through the Mississippian and Pennsylvanian systems in the vicinity of Birmingham.

At the close of the first day, the Southern Natural Gas Co. acted as host to the party and later a banquet was held by the geologists and a group of prominent business men of Birmingham. Dr. Poor was in charge of the program and talks were made by Urban Hughes, president of the society; Joe Dawson, chairman of the field-trip committee; Arthur Blair, on the "Development of the Iron Industry in the Birmingham District"; Charles Blair, on the "Carbon Ratios of the Cahaba, Coosa and the Warrior Coal Fields"; Robert Riggs, of Stanolind, spoke as a representative of the petroleum geologists; and A. I. Levorsen addressed the group concerning the program outlined by the research committee of the American Association of Petroleum Geologists.

Saturday morning, the group progressed northward from Birmingham across the Blount Springs dome in the Warrior Coal basin and examined the Mississippian and Pennsylvanian beds in that area. Of special interest was the asphaltic sand near Hartselle in Morgan County and the geologic section at Monte Sano State Park near Huntsville.

The Hartselle sand is the most important of three asphalt-bearing sands which outcrop in Northwest Alabama. Weathered samples of the sand show a high asphalt content. Although the sand is not asphaltic in the outcrop at Birmingham, Dr. Pool pointed out that in some of the coal mines it showed heavy oil saturation, and it was possible to catch the oil drip where it was penetrated. This has incited much interest in the possibilities of finding oil production to the southwest, downdip from the outcrop area.

In Colbert County two other formations show migration of oil to the surface. The Gasper lime, an oolitic deposit, contains sufficient asphalt to make it valuable as road-building material. It is crushed and applied without treatment, as the asphalt provides sufficient bond. The Bethel sand, Mississippian in age, like the Hartselle, shows asphaltic impregnation at its outcrop in Colbert County.

Sunday, the trip down the Tennessee Valley included stops at the Wheeler and Wilson dams and Muscle Shoals. Many of the geologists who have done core-drill work for the oil companies were especially interested in the large core taken in the Warsaw formation at the base of the Wheeler Dam. This core is 36 in. in diameter.

STATE CAPITALS...

ARKANSAS

AT THE STATEWIDE HEARING held in El Dorado on December 16 a report on the bottom-hole pressures of the state's prorated fields was made. In the Atlanta field, the report stated, on December 4 the bottom-hole pressure was 3,733 lb. per sq. in., or a gain of 32 lb. from September 6 during which period production was reduced from 2,566 to 2,490 bbl. daily for the 17 wells. In the Buckner pool bottom-hole pressure rose 13 lb. to 2,733 lb. on November 8, and in the Magnolia pool, overall bottom-hole pressures decreased 42 lb. between September 10 and November 20. This decline was registered despite production being reduced from 21,227 to 19.387 bbl. daily. In the Schuler (Jones) field the reservoir pressure declined 127 bbl. to 1,701 lb. between September 4 and November 13. In the Schuler (Reynolds) field a decline of 27 lb. to 3,385 lb. was registered between September 4 and November 14, 1940, it was stated.

MICHIGAN

AN OPEN ATTACK ON MICHIGAN'S oil conservation laws has been launched with distribution of a pamphlet by a new association, the Oil Institute of Michigan, virtually demanding the repeal of the act which was passed in May 1939. Organized several weeks ago, the institute has set up offices in Grand Rapids with L. V. Nicholas as president. He formerly was with the Cities Service Oil Co. and Standard Oil Co. Directors of the institute are Walter L. Anderson of Muskegon, president of the Naph-Sol Refining Co.; C. L. Maguire of Mount Pleasant, president of the Roosevelt Oil Co.; Reid Brazell of Alma, vice president and general manager of the Leonard Refineries, Inc., and B. J. Skinner of Alma, president of Mid-West Refineries, Inc.

The initial pamphlet asserts that "restrictive machinery should definitely be removed and no restrictions should be considered until the daily supply of crude oil in Michigan is at least equal to the daily demand for refined products in Michigan." It charges that restrictions of crude-oil production in Michigan has created an artificial shortage in the crude-oil supply and has worked a severe hardship on refiners of Michigan crude oil.

CALIFORNIA

THE CALIFORNIA CONSERVATION COMMITTEE will meet December 19 to set the daily quota for the month of January 1941, but this is expected to be a mere formality inasmuch as no important change is expected to be made in the crude-oil allotment. The committee may make a change in the allowable production of intermediate wells and might decrease the top well allotment a barrel or two but for the most part the program is expected to remain undistrubed. The committee will no doubt, however, give careful consideration to the probability that the Pacific foreign exports will undoubtedly be reduced early in the new year and might be forced to take this into consideration when setting the allotment for the month of January 1941.

The California oil industry does not yet appreciate the fact that Shell Oil Co., Inc., Standard Oil Co. of California, and Union Oil Co. may possibly lose their respective Vancouver, B. C., market for California crude oil in conformity with an impending edict of the Dominion of Canada that Canadian refiners must use Canadian oil in place of imported oil in order to conserve finances. This tend to indicate the probability that Vancouver refiners must use Alberta crude oil. This will probably raise the retail price of gasoline in western Canada and may force marketers to import California fuel oil as the Alberta crude is of a high gravity and will not yield a high recovery of refinery residuum.

WYOMING

SENATE BILL S. 4433, introduced by Sen. Joseph C. O'Mahoney, of Wyoming, and before the Committee on Public Lands and Surveys, passage of which is expected at this session of Congress, will pave the way for the settlement of title disputes on 1,480 acres of land on the northeast side of Lance Creek. This land originally was filed on under the old placer claim mining law. Last February the secretary of the interior filed suit to recover title to the Government and extensive hearings were conducted during the summer. The proposed law is the result of a compromise agreement by which the Government will grant leases as of January 1, 1940, for a term of 10 years or as long thereafter as oil and gas are produced in commercial quantities. Leases will be issued upon showing of the applicant that not less than $10,000 had been expended on each claim prior to January 1, 1940. The leases provide for a flat royalty of 12½ per cent on and after January 1, 1940, and 4 cents per barrel for oil produced prior to that time and ¼ cent for gas. The area has approximately 23 undrilled Sundance sand locations and 16 Leo sand locations. Eight Sundance sand and six Leo sand wells have been drilled to date on the disputed land.

OIL-STATE GEOLOGIST . . .

GEORGE V. COHEE

George V. Cohee, assistant geologist of the Illinois Geological Survey, began working with the survey during the summer of 1935 in the areal geology and subsurface divisions, and since 1936 has been with the Oil and Gas Division. Mr. Cohee received both undergraduate and graduate training at the University of Illinois and was awarded a doctor's degree in geology in 1937. As a student he was employed in the topographic branch of the U. S. Geological Survey, during four summers taught chemistry at University High School, Urbana, Ill.; and was graduate assistant in the department of geology at University of Illinois in 1934-1936. He is author and joint author of several papers dealing with sedimentation and petroleum geology in Illinois

KANSAS

THE STATE CORPORATION COMMISSION has set December 28 as the date for the next state-wide hearing for receiving evidence to be considered in setting the state's January 1941 allowable. The meeting will be held in Wichita, starting at 10 a.m., in the Allis Hotel. This month the commission set Kansas' daily allowable production at 192,400 bbl., 4,000 bbl. over the Bureau of Mines estimated market-demand figure and 2,400 bbl. over the state's allowable in November.

TEXAS

TEXAS' ALLOWABLE PRODUCTION increased 6,275 bbl. daily over last week's figure, the total reaching 1,360,124 bbl. on December 14, the Oil and Gas Division of the Railroad Commission reported on Saturday. This represented an overage of 83,124 bbl. as compared with the Bureau of Mines estimated market-demand figure, but allowing for 3½ per cent underproduction of allowables would lower the allowable to 35,515 bbl. over the bureau's figure. In October underproduction of allowables averaged 4.18 per cent, thus it is probable that the 3½ per cent figure is conservative.

At 109,407 bbl., exempt production gained only 496 bbl. during the week, compared to the 24,650-bbl. gain last week. Under the impetus of 142 additional wells, bringing the total to 94,510, the state's total basic allowable rose to 1,754,230 bbl. daily.

The Southwest Texas district contributed one-third of the week's total net daily allowable gain with 219,413 bbl., an increase of 2,023 bbl. Almost another third came from the Gulf Coast, which produced 235,409 bbl., a 1,976-bbl. increase. North Texas gained 1,061 bbl. to total 11,056 bbl., and East Texas remained static at 371,752 bbl. East Central Texas flowed 83,756 bbl. daily, up 232; West Central, 49,023, up 179; West Texas, 203,502, up 642; Panhandle, 85,303, up 253.

Following the emergency state-wide hearing held at Austin on December 12, the commission has not indicated what steps it would take toward reducing the state's allowable within the bureau's estimated-demand figure. Col. E. O. Thompson, previous to the hearing, had suggested a reduction of 60,000 bbl. Other than that no clue has been offered when a new order, if any, will be issued or how the cut will be effected.

NEW MEXICO

THE OIL CONSERVATION COMMISSION of New Mexico in setting that state's December allowable at 104,000 bbl. daily allocated production (in barrels) to fields in Lea County as follows: Arrowhead, 3,312; Cooper, 2,805; Corbin. 72; Eaves, 641; West Eunice, 324; Eunice, 16,501; Halfway, 216; Hardy, 2,960; Hobbs, 8,987; Jal, 421; Langlie, 3,909; Lynch, 373; Lynn, 883; Mattix, 4,454; Monument, 17,266; North Lynch, 32; Penrose, 4,659; Rhodes, 251; Skaggs, 71; Skelly, 1,867; South Eunice, 2,450; South Lovington, 1,224; Vacuum, 11,632; or Lea County total, 85,310 bbl. daily. Remainder of the allowable, 18,605 bbl., was prorated among fields outside Lea County with Eddy County wells having a top allowable of 44 bbl. daily.

The OIL AND GAS JOURNAL

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A Director Is Curious

"How will that tax money be spent?"

The question came from a director representing investment interests at a board meeting where an oil company's management was reviewing the past year and explaining 1941 plans.

At the meeting, while the year's profits were modest, those in charge of operations gave a satisfactory account of their management and there was little criticism of the program for the coming year. Regarding 1940's activities, they were able to show savings in practically every phase of the company's operations. Active officers had been alert not only in regard to reductions in expenditures but also had taken advantage of all new developments which increased operating efficiency and thus aided in reducing costs.

The new budget which was carefully prepared was designed to obtain the largest possible return from every dollar expended. Departmental heads explained convincingly the details of the program.

The director's question came as an anticlimax and some present may have thought it was ill-timed.

While taxes were the only major disbursement which could not be accurately projected, they were covered in the budget with the usual assumption that they would increase next year—they always had.

But when it came to explaining how the money would be spent by the governmental agencies the management's attitude was that it had no more control over that than it had of the rainy weather outside.

Investigation showed that this year, the company's gasoline-tax payments to the state and federal Government exceeded what the company received for the product at its refineries. They also exceeded the company's payroll by more than 100 per cent.

The state taxes levied against production equaled the amount expended for exploration, the foundation of the company's operations. Adding all the taxes together it was discovered they amounted to more than a dollar-per-barrel charge against the company's combined crude production and purchases.

The company's social-security payments were part of a gigantic national levy totaling a billion and a quarter yearly. The accumulations from these taxes, which are supposed to protect the future of employes, are being used to aid in financing current federal deficits.

What is more important, the end in increased taxes is not in sight. Without including any part of the so-called capital expenditures of the defense program, which are to be added to the public debt, a truly pay-as-you-go policy, based on governmental outlays assured for 1941 and later years, would mean that present federal taxes would be doubled.

Political expediency cannot postpone the collection of these taxes indefinitely. When they come they will be collected largely from the man in the street. This means a direct charge against the American standard of living which in turn explains why this country's consumption of petroleum is twice that of the remainder of the world.

The oil industry has had a steady increase in the demand for its products which has enabled it to quickly recover from conditions brought about by overproduction. Excessive taxation levied against petroleum consumers will mean the end of that desirable trend. The industry cannot meet this threat by ignoring what happens to taxes after they are paid.

The director's question was entirely in order. He could not have asked one more pertinent to the future of his company and the industry of which it is a part.

Directors should continue asking until management knows as much about its tax dollar as it does about its operating dollar. Then, and then only, will the reckless and wasteful spending of public funds come to a halt.

Chemical Exposition Shows Growing Importance of Oil

THE increasing importance of petroleum as a basic material for the manufacture of synthetic articles was evidenced by exhibits and papers presented before the National Chemical Exposition held in the Stevens Hotel in Chicago, December 11 to 15.

Dr. Gustav Egloff, research director for the Universal Oil Products Co. summarized the work which chemistry is doing in industry and emphasized the part played by petroleum. He said, in part:

"As a recognized member of industry, chemical research has just passed its majority. It really began about 25 years ago. Chemical research has grown steadily but even for a long time after it had begun to demonstrate its usefulness, it still was regarded by some as a necessary evil. The money to finance it was relatively small and was given grudgingly, but this condition has long since been changed. Chemical research and development have become almost an industry in themselves, financed by gigantic sums estimated today to be $180,000,000 a year. It seems safe to say that this is merely a good beginning, judged by the many problems still to be solved. When one chemical question is answered, ten more appear.

"The most important task lying before us today is to devise, and speedily, the best way to defend what we have won in this country. National defense today is our greatest immediate problem. While commercial aviation has progressed rapidly during the past few years, high costs have severely limited the use of the airplane in one of its most valuable potential functions —that is the carrying of freight. This limitation is being somewhat removed through developments produced by defense necessities. A new type of airplane is now under design that can carry 20,000 gal. of gasoline besides passengers and payload. The oil industry has the processes ready to produce sufficient motor fuel of 100 octane or better to power 50,000, 100,000 or any conceivable number of airplanes for any needs and plants can be readily built to produce it. In fact, it is being produced in quantity today. All indications are that the course of the aviation industry will follow that of the automobile. Costs will be cut down. And automobile development is not standing still either. Cars are continually being increased in power, speed, and safety while prices go down.

"Let's consider some other products for the use of our fighting forces. The discovery that toluene could be synthesized from petroleum was followed by the invention of processes to make it. These processes are now available, designs have been prepared, and plants are being built. One is already operating, making 2,000,000 gal. of toluene a year and another to produce 30,000,000 gal. a year is under construction. This volume is greater than that produced by all the carbonizing units making toluene from coal, which until recently was the only source of supply.

"Another of our strategic materials necessary for national defense is rubber and it is one in which we were most vulnerable. Our rubber comes mostly from the Far East. Most of our tires are made in Akron, Ohio. The two points are more than 10,000 miles apart, over now-dangerous seas. Control of the world rubber supply has always been in other hands than ours, but supply so far has never been limited if we would pay the price. We now have processes available to produce synthetic rubber better than trees ever grew from a fraction of petroleum.

"Synthetic rubber is not new, but late inventions have supplied the missing link which makes it possible to produce better synthetic material than was ever made before at a lower cost.

"In this connection, four important points stand out: 1. Butadiene, the petroleum fraction which is the source of synthetic rubber, can be produced in unlimited quantities by the new processes. 2. The present machinery used for processing natural rubber can be adapted without difficulty to work the synthetic product. 3. Additional plant capacity to increase rubber production to meet the entire needs of the country, about 600,000 tons a year, can be built and equipped, it is estimated, at a cost not exceeding $200,000,000. 4. Experienced men estimate the cost of producing synthetic rubber at present to be 25 cents a pound whereas the quoted price for natural rubber today is 20 cents a pound. About 75 per cent of the rubber used in this country goes into tires. Calculations show that tires made of synthetic rubber at 25 cents a pound would cost less than 5 per cent more than those made of natural rubber at 20 cents."

Dr. Per K. Frolich, director of research for Standard Oil Development Co., discussed new developments in synthetic chemicals, with special emphasis on rubber substitutes. He pointed out the part petroleum could play in supplying this nation's needs and said:

"The synthetic rubber industry has developed to a point where plant capacity should be available next year for the production of some 50,000 lb. per day. Impressive as this figure is, considering that it refers to highly specialized manufacturing operations, it represents less than 2 per cent of our crude-rubber imports. There is consequently considerable room for expanding production as manufacturing costs are lowered.

COMPACTERS INVITED TO OIL EXPOSITION . . .

An unexpected presentation was made December 7 to members of the Interstate Oil Compact Commission meeting in Tulsa for their third annual conference when William G. Skelly, president of the International Petroleum Exposition, and Frank O. Prior, member of the executive committee, presented an official invitation to attend the May 16 to 23, 1942, Tulsa oil show. Gov. Leon C. Phillips of Oklahoma accepted the invitation, in the form of a huge admittance ticket, on behalf of the commission. In the picture, commission members who received the invitation are: (front row) Warwick M. Downing, Denver, Colo.; Maj. B. A. Hardey, director, Louisiana Conservation Commission; Governor Phillips; Gilbert E. Kiebler, representing Gov.-elect Dwight Green of Illinois; W. J. Holloway, ex-governor of Oklahoma. (Back row): O. C. Bailey, chairman, Arkansas Oil and Gas Commission; Ewing T. Kerr, attorney-general of Wyoming; Col. W. H. McFaddin, Fort Worth, Tex.; E. J. Coyle, representing Gov. John Stelle of Illinois; Frank O. Prior, president, Stanolind Oil Co.; Hiram M. Dow, New Mexico; Andrew F. Schoeppel, chairman, Kansas Corporation Commission; Judge J. C. Hunter, president, Mid-Continent Oil and Gas Association, and Olin Culberson, Railroad Commissioner-elect of Texas

Impose Fines of $45,000 Against Oil Companies

MADISON, Wis., Dec. 17.—The Texas Co. and Tide Water Associated Oil Co. along with some of their executives will face trial here January 20 in the federal Government's suit alleging conspiracy to fix gasoline prices in violation of the Sherman-Clayton anti-trust law.

Fines totaling $45,000 were imposed December 12 against three companies and three individual executives who, with others, entered pleas of nolo contendere before federal Judge Walter C. Lindley, at Chicago. Charges against two companies and five individuals were dismissed by Judge Lindley.

Globe Oil & Refining Co. of Illinois was fined $7,500; the Gulf Refining Co., $5,000; the National Refining Co. of Cleveland, $7,500; W. V. Hartman, general sales manager of Gulf, $15,000; J. W. Carnes, vice president of Sinclair Refining Co., $5,000; C. B. Watson, vice president of Pure Oil Co., $5,000.

Companies and individuals dismissed were the Globe Oil & Refining Co. of Kansas; Globe Oil & Refining Co. of Oklahoma; J. F. Drake, president of Gulf Oil Corp.; O. H. Carlisle, Gulf division manager at Houston, Tex.; A. M. Hughes, Phillips Petroleum Co., and I. A. O'Shaughnessy, Pure Oil Co.

Supreme Court Hears Suits Attacking Validity of Commission's Orders

WASHINGTON, D. C., Dec. 17.—Decision of the Supreme Court has not been announced in the Humble Oil & Refining Co. suit attacking validity of the Texas Railroad Commission's East Texas proration policy. Final arguments were presented December 12 and 13.

Dan Moody of Austin, Tex., former governor of Texas, and Rex G. Baker, of Houston, attorney for Humble, argued the case for plaintiff and James P. Hart, assistant attorney general of Texas, represented the defendant commission. Mr. Moody represented Rowan & Nichols Oil Co. and Mr. Baker argued for Humble. Effort was made to show that the litigation differed from that decided in favor of the commission in the Rowan & Nichols suit upon which the Supreme Court ruled June 3.

Questions from the justices indicated that the court will hold as in the original suit that "it is not for the federal courts to supplant the commission's judgment even in face of convincing proof that a different result would have been better." The line of questioning indicated that the justices lean toward respect for state commission orders unless confiscation is obvious.

Mr. Moody asserted that the proration orders, changed every 30, 60, or 90 days, "do not distribute on a reasonable basis and result in confiscation." When Mr. Hart started his argument, Chief Justice Hughes asked if the questions were the same as in the case already decided. On Mr. Hart's assertion that issues were the same, the chief justice asked to hear the plaintiff's arguments. Mr. Hart elected to not reply after Mr. Moody and Mr. Baker concluded.

New Pattern for Regulation Will Be Urged by Committee

By HENRY D. RALPH

WASHINGTON, D. C., Dec. 16.—A new pattern for federal regulation of industry, replacing the antitrust laws to some extent but short of N.R.A. codes, probably will be recommended to Congress by the Temporary National Economic Committee within the next 3 months.

The basic outline of such a plan of regulation is contained in a T.N.E.C. monograph on "Antitrust in Action," written by Prof. Walton Hamilton, of the Yale Law School, and there is good reason to believe that it fairly represents preponderance of thought on the T.N.E.C. itself.

That the Sherman Antitrust Act is not applicable to present-day industrial conditions is the main thesis of this report, but the author does not suggest scrapping it entirely. Instead, he proposed more funds for its enforcement, particularly for investigation and economic analysis, and more legal power for its enforcement, such as heavier penalties and direct subpena power by the Department of Justice. But his most important suggestion is that industry be allowed to submit a sort of code of trade practices (though he tries to avoid this term) which when approved by the Department of Justice would give the industry a limited immunity from prosecution. Appeals from administrative decisions on these "codes" would be to a special court familiar with industry problems, and from this directly to the Supreme Court of the United States.

References to the oil industry are sprinkled through the document by way of illustration, but, more important, the structure and problems of the oil industry seem to be between the lines throughout the entire discussion. It is not too much to infer that Dr. Hamilton believes that the Madison oil case accomplished nothing and that the newly filed divorcement and disintegration suit is not the proper approach to correct current complaints.

Walton Hamilton was one of the N.R.A. advisors and was virtually administrator after General Johnson left. He has been identified with several New Deal projects and is recognized as an authority in the field of business regulation. In writing this report he was assisted by a number of persons whose ideas carry weight in administration circles. The publication carries the usual foreword that the ideas are those of the author and approval by the T.N.E.C. should not be implied, but it is known that several members of the T.N.E.C. are inclined to favor the sort of regulatory procedure Dr. Hamilton suggests.

Failure of Sherman Act

By far the most readable document so far produced by the T.N.E.C., the 120-page monograph is a realistic analysis of the problem of preserving the public interest in the activities of business. In practical, sometimes satirical, language, Dr. Hamilton explains why the Sherman Act has not worked to preserve competition or equality of business opportunity and why it cannot be expected to do so in these days except in a limited application. Though both a lawyer and an economist, the author severely criticizes attempts to regulate business through a pattern of "academic economics or legal law." Neither trial attorneys nor the courts have the ability to regulate business, he says, and his criticism of antitrust procedure should make rather uncomfortable reading for some officials in that division.

The Hamilton plan, which the author sketches in only general terms, centers around a new administrative body to negotiate with an industry over trade practices and economic trends to evolve a plan of doing business somewhere between an N.R.A. code and a court consent decree. This body might be a part of the Department of Justice but would not be a part of the antitrust division. Its staff would be composed of men who understand business practices and speak the business language. Proceedings would be public, and every action would be preceded by an extensive investigation of the industry, not to uncover past misdeeds but to find a basis for correcting current industrial practices.

Details of the "code making" process are not elaborated by Dr. Hamilton, but he raises many questions which will have to be answered, points out many pitfalls to be avoided, and particularly warns against the dangers of bureaucracy. In this he draws heavily on his experience with N.R.A. and other government activities, and he calls for a flexible, undoctrinated organization staffed by men who can handle business problems in a practical way, working out different patterns of operation for various industries as the facts demand rather than fitting all business to a set formula.

Not Suited to Conditions

The most important aspect of this report is the positive conclusion that the Sherman Antitrust Act, both in its conception and its method of operation, is not suited to present-day conditions, and that some sort of administrative machinery must be substituted for the present process of secret investigation, prosecution, criminal stigma, court trial, and legal bickering.

There is nothing novel in the assertion that the Sherman Act was designed to force the utmost competition on the theory that competition is the life of trade and the protection of the public but that this theory must be abandoned now because the ills of many industries are due to overcompetition while other industries are so integrated that they cannot be unscrambled. But Professor Hamilton clinches this conclusion by ridiculing the record of the Sherman Act and the processes of the antitrust division.

The oil industry is a perfect example for illustrating almost every point made in the monograph "Public policy and current reality are at serious odds," says the author. "In the minds of many business men the belief in antitrust belongs to one world and the actualities of business conduct to quite another. A next step in making industry serve the general welfare is imminent. As a method of regulation, trust-busting belongs to an era of laissez faire."

Directly applicable to the oil situation is this paragraph:

"In instances competition itself may become the mother of restraint. There can be a plethora, as well as a dearth, in rivalry for trade. A glutted market, an excess output, a surplus capacity are unruly forces. They tend to drive price below cost, to touch off secret discounts, to turn quotations into fictions, to invite bankruptcy. In such a situation firms are prone to take counsel together to create a protection the market seems unable to provide . . . Even in a big business like gasoline the drilling of wells, to an accompaniment of competition, makes for an overproduction with which the market cannot cope. Where such situations prevail, the way of antitrust is not straight and narrow. It is an overplus, rather than a want, of competitive zeal which lies at the heart of the difficulty. As a governor of industry the market has failed of its office. Yet any concerted move against impending disaster may run afoul of the law."

Oil Industry Cited

The sections of the report explaining why the trust-busting approach is utterly incompetent to deal with modern industrial problems fairly bristles with references to the oil industry, expressed and implied. For example, in discussing the manner in which the antitrust division initiates its cases on complaint of independents, the author says: "Appeal to antitrust is a habit common to some industries . . . In oil a continuous stream of complaints alleges restraint along the industrial line from well to filling station. Here the habit goes back to the eighties and nineties; it was dramatized by the victory of the Government over 'the octopus' of Standard Oil. A sharp enmity marks the struggle between the major companies and the independents; the cry of monopoly is in the nature of a tradition. Antitrust has had the industry under almost constant observation; the person who recites incidents to show restrictive practices in oil is sure of his audience."

In discussing the cost of litigation he says "a major antitrust suit is almost of necessity a Hollywood production," and uses the Madison oil trial as an example. In considerable detail Dr. Hamilton describes the entire process of the antitrust case and shows clearly wherein each step is inadequate for the purpose to which it is put—F.B.I. investigation, the grand jury, gathering evidence rather than facts, legal motions, personality and limitations of the judge, criminal penalties, civil fines, and even the consent decree which he says has some promising features if it could be freed from the restrictions of court procedure.

A very "proindustry" attitude is expressed by the author, who points out time and again that business men do not do the things that get them in the toils of the Sherman Act through any intent to gain a monopoly but through an effort, often desperate, to solve some pressing problems facing their industry.

Postpone Hearings on Cole Federal Regulation Bill

WASHINGTON, D. C., Dec. 16.—Reopened hearings on the Cole bill for federal regulation of oil conservation practices, scheduled to start today, were indefinitely postponed late last week after a series of official moves which suggest that all parts of the administration do not see eye to eye on the subject of federal control of the oil industry.

Early last week Rep. William P. Cole, Jr., of Maryland, announced that he would call together his subcommittee of the House committee on interstate and foreign commerce to hear new witnesses discuss the relationship of oil conservation to national defense. He admitted that a request for such a hearing had been made by President Roosevelt, but declined to make public the president's letter until the committee convened. Witnesses scheduled to appear this week included representatives of the National Defense Advisory Committee and the War and Navy departments, including Defense Commissioners Stettinius and Henderson and the N.D.A.C. petroleum adviser, Dr. Robert E. Wilson.

The only explanation for calling off the hearings was that the witnesses were not ready to present their material. It is learned on good authority, however, that a more pressing reason was a fear, if not a knowledge, that the prospective witnesses would say that additional federal controls over the oil industry would hamper rather than promote the defense program. Some Army and Navy officials are known to be skeptical of the present value of the Cole bill, and Commissioner Leon Henderson took an active part in the N.D.A.C. report to the Department of Justice criticizing the proposal to bring an antitrust suit to force divorcement of pipe lines from major-company ownership.

A new form of legislation to replace the Cole bill in the next Congress is now being drafted through collaboration of the Cole subcommittee and the Interior Department, and the subject will be kept alive. Exact form of the new proposal is not known, but the presumption is that it proposes greater cooperation between the federal Government and states which have conservation laws and enforcement machinery, and will also provide for regulating production to some degree on the basis of demand, particularly for national-defense needs, rather than exclusively on engineering practices designed to give maximum ultimate recovery of crude oil.

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Building of Coastal Pipe Line Being Considered By Federal Agencies

WASHINGTON, D. C.—Construction and operation of a pipe line by the federal Government from the Mid-Continent, probably originating on the Texas Gulf Coast, to Portsmouth, N. H., is being seriously considered by governmental agencies and also is being discussed in Congress. The pipe line, reaching all important Army and Navy stations on and near the coast all the way to Portsmouth, would be built to guarantee adequate runs of crude oil to eastern refineries and to assure adequate deliveries of aviation fuel in event of emergencies.

The National Defense Advisory Commission has given substantial attention to such a project in considering transportation facilities to the East Coast. Need for additional pipe-line facilities has been outlined and tentative plans prepared for carriers to fill in missing links at a cost of about $13,000,000.

The coastal pipe line is understood to have been one of the important matters scheduled for consideration before the Cole committee in its hearings, now postponed until after January 1, 1941. Secretary of the Interior Harold L. Ickes has admitted that the question of a government pipe line around the coast from Gulf refineries to the most northern important naval base has been given consideration, both in his department and among members of Congress.

Compact Commitee to Submit Recommendations December 30

OKLAHOMA CITY, Okla., Dec. 17.—Committees appointed last week to consider a financial program and revision of bylaws for the Interstate Oil Compact Commission have been asked to make recommendations at the Oklahoma City meeting December 30.

Andrew F. Schoeppel, Wichita, Kans., chairman of the Kansas Corporation Commission, and representative for his state on the commission, was appointed chairman of the finance committee. J. C. Hunter, of Abilene, Tex., member of the commission, and W. H. McFadden, of New Orleans, La., are other members of the finance committee. In making the appointments, Gov. Leon C. Phillips of Oklahoma, chairman of the compact body, outlined duties as consisting of a study of the problem of providing finances to carry on the necessary expenses of the commission, to prepare a budget so that recommendations may be made by the commission to the various states for voluntary contributions.

Hiram M. Dow, of Artesia, N. M., compact representative for New Mexico, is chairman of the committee to consider amendments to the bylaws. W. J. Holloway of Oklahoma City, attorney for the commission, and P. J. Hoffmaster, Lansing, director of the Michigan Department of Conservation, are other members of the bylaw committee. This committee will consider and report on such amendments to the bylaws as may be necessary to carry out the enlarged program of the commission.

Revision of the bylaws to permit participation of government-agency representatives in various phases of the commission work and perhaps independent organizations has been advocated.

DEATHS

JAMES S. CRATE, 54, secretary and first assistant treasurer of the Humble Oil & Refining Co., died at his home in Houston, Tex., Saturday afternoon. Mr. Crate was born in San Antonio and became associated with the Humble company in 1918. He was also secretary-treasurer of the Petroleum Casualty Co., a subsidiary of the Humble Oil & Refining Co. Mr. Crate was made cashier of Humble in 1919, in 1922 was promoted to assistant treasurer and in February 1938 was advanced to secretary and first assistant treasurer.

G. W. HAMILL, export representative for the Frick-Reid Supply Co., New York, died suddenly of bronchial pneumonia Monday morning, December 9, in a New York hospital.

THURMAN H. MYERS, 50, chief engineer and geologist of the Carnegie Natural Gas Co., died at his home in Pittsburgh, Pa., December 9, following illness of several months' duration. Mr. Myers, who served with Carnegie Natural since 1936, was one of the best-known engineers in the eastern part of the United States. Born in November 1890 at Middletown, W. Va., he served as engineer for the Chalmers Oil Co. at Baltimore in 1915-16 and was engineer and geologist for Benedum & Trees in Cuba in 1917-18. From 1918 to 1921 he was superintendent and geologist for the Carter Oil Co. in Kentucky and Tennessee. After serving as superintendent and geologist for the Llano Oil Co. in Texas and New Mexico, he was manager and geologist for the Penn-United Gas Co. for Pennsylvania and New York from 1931 to 1936. He leaves the widow and three sons.

THOMAS E. SEIGLER, 56, geologist and oil operator of West Texas, died in a Hereford, Tex., hospital on December 14 following an operation a week previous, after which he contracted pneumonia. A native of Collin County, Texas, he entered the oil business at Olney where he became a successful geologist and oil operator. At the time of his death he maintained an office in Wichita Falls, where he held considerable oil interests, but since 1926 had resided in Deaf Smith County, engaging in wheat raising and breeding of Hereford cattle. He was active in oil associations as well as cattle breeding and civic affairs.

GEORGE WORLEY, 71, retired geologist active in the development of early Illinois fields and in the Cushing and Drumright fields of Oklahoma, died at his home in Tulsa on December 12. Mr. Worley came to Tulsa in 1911 and soon afterward joined Tidal Oil Co. as geologist. He is survived by the widow, a daughter and two sons.

GEORGE H. TABER, 82, named "grand old man of refining" at the 1940 International Petroleum Exposition in Tulsa, died December 10 in Pittsburgh, Pa. He entered the oil business in 1882 at Long Island City, N. Y., and remained active until in 1928 when he retired as vice president of Gulf Refining Co. Survivors include his son Phillip Taber of Tulsa, drilling contractor; George H. Taber, Jr., of Rye, N. Y.; and two daughters.

PATRICK F. WALL, 84, veteran pipe-line construction foreman, died December 10 in a hospital at Wellsville, N. Y. A native of Lancashire, England, he came to this country at the age of 2. He went to work for New York Transit Co. at the age of 22 as a construction foreman and continued at this work until his retirement in 1927.

ROBERT McKAY, organizer of the Oxville Oil & Gas Development Co., which some 15 years ago discovered the field oil and gas shows in the Lloydminster field in Saskatchewan, died recently in Lloydminster.

●

THE MARKETS*

CRUDE OIL: Another advance of 15 cents for Pennsylvania crude oils became effective at 7 a.m. December 17, increasing Bradford, Allegany, Southwest, and Eureka crudes to $2.15 per barrel. The advance was instituted by South Penn Oil Co. and was met by Pennzoil Co. and Quaker State Oil Refining Corp. The same group of companies joined by most other purchasers advanced Pennsylvania oil 15 cents November 12. Sinclair Refining Co. met the advance of November effective December 10. The Texas market is unchanged.

REFINERY: Distillate-fuel-oil prices were advanced an eighth of a cent per gallon by inland refiners reflecting the insatiable demand of buyers in the Middle West. Cold weather and snow in the northern part of the Middle West has cut into the volume of gasoline shipments from Mid-Continent refiners and increasing tanker rates are discouraging coastwise movement. The Gulf market is dormant and the entire price structure is soft, although most buyers feel the floor has been reached.

TANK-WAGON AND POSTED-DEALER: Failure of the 1-cent posted-dealer price in Texas to hold was the feature of the week in this phase of the markets. One major marketer declined to meet the original advance instituted by the Texas Co., another major marketer advanced and then retreated and finally the pace setter was forced to abandon its position as untenable. Distillates were advanced 0.2 cent in New Jersey.

FINANCIAL: A slight recovery was apparent this week in oil securities. Average of 30 representative stocks for the week ended December 14: High, 23.77; low, 22.68; close, 23.40. Week ended December 7: High, 23.65; low, 22.47; close, 23.10.

*Detailed information in Market Section.

International

Venezuela . .

Crude Production Slumps To 1940 Low in October

A NEW low for 1940 crude-oil production was established by Venezuela in October.

Production for the month was approximately 13,762,400 bbl., based on conversion of 2,053,170 metric tons of reported output at the rate of 6.703 bbl. per ton. The approximate October production is 791,270 bbl. below the output in September. Daily average output in October was 443,950 bbl., compared to 485,120 bbl. in September.

Most of the Venezuelan fields produced at approximately the rates obtaining earlier in the year. Lagunillas was the exception. Despite gains in the output of several Lake Maracaibo fields the decline in October of almost 1,500,000 bbl. in recovery from Lagunillas was too great to be offset entirely.

Most of the Lagunillas decline centered on operations of Lago Petroleum Corp. which had a reduction of 964,450 bbl. in October production compared to September.

The production by companies and fields for October and September appears in the following tables:

PRODUCTION BY COMPANIES

Company—	Oct.	Sept.
Caribbean Petroleum Co.	930,275	885,045
Venezuelan Oil Concessions, Ltd.	3,690,450	3,966,075
Colon Development Co.	455,610	506,520
Lago Petroleum Corp.	2,463,690	3,428,140
Mene Grande Oil Co.	3,540,710	3,369,765
British Controlled Oilfields, Ltd.	21,385	20,335
Central Area Exploitation Co.	51,245	51,500
Standard Oil Co. of Venezuela	2,582,945	2,304,235
Compania de Petroleo Lago	21,680	19,655
Tocuyo Oilfields of Venezuela, Ltd.	.....	155
Socony-Vacuum Oil Co.	4,410	885
Texas Co. (Venezuela), Ltd.	.....	1,360
Total	13,762,400	14,553,670

PRODUCTION BY FIELDS

Field—	Oct.	Sept.
Cabimas	1,261,745	1,239,425
Lagunillas	3,286,000	4,847,210
Tia Juana	3,065,520	2,733,345
Bachaquero	193,060	187,015
La Concepcion	61,125	58,355
La Paz	41,660	35,230
Mene Grande	930,275	885,040
El Cubo	455,610	506,525
Cumarebo	73,635	66,170
Las Palmas	2,145	2,285
El Mene de Mauroa	21,385	20,335
Hombre Pintado	51,245	51,500
Quiriquire	1,723,615	1,519,110
Pedernales	144,940	145,885
Temblador	340,860	332,635
Oficina	1,562,390	1,444,095
Jusepin	331,870	280,535
Santa Ana	6,120	7,265
San Joaquin	122,740	112,255
El Roble	77,985	69,395
El Tigre	1,520	3,030
Guario	4,410	885
Socororo	440	4,630
El Mene de Acosta	.....	155
Leona	2,105	.....
Los Caritos	.....	1,360
Total	13,762,400	14,553,670

Rumania . .

Expect to Double Exports to Germany

WINTER exports of Rumanian oil to Germany are expected to be doubled as the result of the doubling of the railroad tracks over the Carpathian Mountains, according to advices from Bucharest. Winter shipments are normally curtailed because of the freezing of the Danube, principal traffic artery between the Balkans and Germany. A statement in a Bucharest paper, Curentul, attributed to Octav Onicescu, a member of the Rumanian trade commission sent to Berlin, said that instead of 130,000 tons of gasoline monthly, Germany would receive 250,000 tons during the winter.

Also reported from Bucharest was the destruction of a large tank of high-octane gasoline said to be on the property of Romano Americana, Standard subsidiary. The tank was destroyed by fire, believed to have been started by a workman's cigaret. German and Rumanian soldiers were said to have extinguished the flames.

Mexico . .

Production Rises 2,000 Bbl. Daily

CRUDE-OIL production in Mexico increased to 127,760 bbl. daily in September, an increase of approximately 2,000 bbl. compared to August. Production of Panuco crude increased substantially in the month compensating for slight declines in other parts of the country.

September production in the Poza Rica field was 2,520,824 bbl., a daily average of 84,027 bbl., compared to 81,654 bbl. in August. Panuco crude production increased to 533,430 bbl. in September compared to 453,075 bbl. in August. Most of the increase came from properties operated by Petroleos Mexicanos, probably reflecting the growing export demand for heavy crudes yielding a high percentage of residual fuel oil. September production consisted of 165,985 bbl. from properties of independent companies retaining their individual operating status in Mexico and the remainder of 3,666,800 bbl. came from nationalized properties under supervision of Petroleos Mexicanos.

The production by districts for the months of September and August follows:

(Figures in barrels)

Region—	Sept.	Aug.
North Tampico (Panuco)	533,430	453,075
South Tampico (Naranjos)	349,466	456,962
Poza Rica	2,520,824	2,531,285
Isthmus	429,041	457,371
Total	3,832,761	3,898,693

Retrenchment steps in the Mexican petroleum industry have been launched at long last by the discharge of approximately 4,000 workers placed on pay rolls of the federal administration since expropriation in 1938. The program of converting the nationalized petroleum industry in Mexico from a profitless exploration of central government administration was repulsed repeatedly by the labor syndicates. A report by the federal Labor Board issued recently painted a picture so dark that action was finally forced.

Necessity of reducing the operating expenditures by the industry has been one of the major objectives of ex-President Cardenas for months. The start on the program he has advocated for nearly a year was made just before he relinquished office December 1.

In a report prepared by the federal Board of Conciliation and Arbitration it was pointed out that petroleum production in Mexico during the 1938-40 period was less than in 1936-37; that the Panuco and Faja de Oro fields are definitely on the decline and that Poza Rica offers the only possibility of profitable exploitation.

The report states that exploratory operations since 1938 have been insufficient for securing the existence of the industry and that exploitation of existing petroleum reserves has been technically faulty. The report affirms that production of gasoline and distillates has decreased appreciably notwithstanding a steadily augmented domestic consumption while at the same time exportation of petroleum and products has declined 27 per cent.

Reduction of personnel employed in the industry, coordination of administration, refining and transportation services are among the important recommendations in the report.

Far East . .

Anti-Japanese Demonstration in Netherlands East Indies

THE respite that apparently followed the conclusion of negotiations between American and British oil companies operating in the Netherlands East Indies on one hand and the Mitsui company of Japan on the other was disturbed last week when anti-Japanese incidents were reported to have taken place in the islands. The demonstrations were followed by sharp protests from Japan. Tokyo observers viewed the action as a forerunner of heavier economic demands on the islands.

Another possibility that Japan has accelerated the tempo of her negotiations for oil supplies from the Indies is seen in the report that a successor to Ichizo Kobayashi, minister of commerce, as head of the Japanese Netherlands East Indies economic mission, had been named. The delay in arriving at an agreement satisfactory to Tokyo has reportedly stimulated Japanese efforts for an early showdown on the part the Indies may be expected to play in supplying Japan's oil needs.

U. S. S. R. . .

Construct Special Transfer Equipment at Frontier

THREE hours are sufficient to transfer 24 tank cars of petroleum from broad-gage railroad equipment of the U.S.S.R. to German equipment on the San River frontier, according to a report transmitted to this country by the United States trade attache at Berlin.

Special transfer equipment has been constructed on the San River border for transfer of petroleum products. Electric pumps and underground connections are arranged in order to permit discharge and reloading of several cars simultaneously.

The United States trade attache's report said that 24 tank cars, each containing 50 tons (approximately 450 bbl. of gasoline) were transferred from equipment of the U.S.S.R. to German in 3 hours.

TABLE 1—DISCOVERY WELLS IN SOUTHEASTERN ILLINOIS

Field, county, company, farm—	Location	Formation	Top of pay (ft.)	Initial production (bbl.)	Completion date
Aden, Wayne, Texas 1 Silverman	19-3n-8e	McClosky	3,276	385	2- 2-38
Leech, Wayne, Sloan & Allen 1 Walker	16-3s-9e	McClosky	3,420	250	9-14-38
North Aden, Wayne, H. H. Weinert 1 Twist	4-2s-7e	McClosky	3,309	400	7-27-38
Barnhill, Wayne, Carl Robinson 1 Felix	27-2s-8e	McClosky	3,386	460	2- 7-39
Calvin, White, J. W. Carter et al 1 Johnson	12-4s-10e	McClosky	3,191	210	10-10-39
Cowling, Edwards, C. G. McFadden 1 Bump	34-2s-14w	Cypress	2,625	240	10-10-39
Golden Gate, Wayne, New Penn Dev. 1 Wagner	30-2s-9e	McClosky	3,432	20	3- 7-39
Grayville, Edwards, Kingwood 1 Johnson	18-3s-11e	McClosky	3,096	415	9- 6-39
Griffin, Wabash, W. N. Bartlett 1 Stansfield	19-2s-13w	Penn. ss.	1,713	210	6-13-39
Junction, Gallatin, Coates et al 2 Greene	17-9s-9e	Waltersburg	1,757	130	5-16-39
Keensburg, Wabash, Neff 1 Bump	9-2s-13w	Cypress	2,397	286	7-25-39
Mount Carmel, Wabash, Washburn 1 Pfeifer	13-1s-13w	Tar Springs	1,940	44	6-27-39
Mill Shoals, White, Nation et al 1 Belvia McIntosh	31-3s-8e	McClosky	3,360	76	7-11-39
New Harmony, White, Sun 1 Ford	18-5s-14w	McClosky	2,998	20	7-11-39
Phillipstown, White, Sun 1 Garner	1-5s-10e	Aux Vases	2,942	20	10-24-39
Stokes, White, Penn.-Ill. O. & G. 1 Pyle	12-6s-8e	McClosky	3,082	423	10- 3-39
Storms, White, Eason 1 Storms heirs	14-6s-9e	Waltersburg	2,215	*12.3	7-11-39
Springerton, White, P. F. Marrel, 1† Cox	6-4s-8e	Aux Vases	3,235	368	8-29-39
Albion, Edwards, Noah & Morrison 1 Barnes	24-2s-10e	McClosky	3,130	132	3-26-40
Inman, Gallatin, Colbeck et al 1 Duffey	25-8s-9e	Rosiclare ss.	2,803	7½	4- 9-40
Dale, Hamilton, Kingwood 1 Wilson	6-6s-7e	Cypress	2,862	115	3-26-40
Lancaster, Wabash, Riddle et al 1 Seibert	4-1n-3w	McClosky	2,686	500	4- 2-40
Maud, Wabash, Lambert 1 Sieler	27-1s-13w	McClosky	2,615	192	6-18-40
Mount Carmel†, Wabash, Delta Drilling 1 Utter	17-1s-12w	Cypress	2,014	19	1-30-40
Burnt Prairie, White, Bishop Harrington Busch 1 Griffin	28-3s-9e	McClosky	3,445	103	1-23-40
Centerville, White, Sun 1 C. Brown	2-4s-9e	Ste. Genevieve	3,341	631	5-28-40
Iron, White, J. W. Carter et al 1 O. Johnson	25-6s-8e	Hardinsburg	2,485	635	2- 6-40
Roland, White, Kingwood 1 Martin	13-7s-8e	Tar Springs	2,244	36	7- 2-40
Hoodville, Hamilton, Kingwood 1 Morris	34-5s-6e	McClosky	3,189	150	7-16-40
North New Harmony, White, Superior 2 Fitten	27-4s-14w	Tar Springs	2,225	90	7-16-40
Herald, White, Carter 1 Dagley	11-7s-9e	Pennsylvanian	1,502	55	9- 4-40
Thompsonville, Franklin, Manley Oil Co. 1 Downen	26-7s-4e	McClosky	3,102	800	10- 1-40
Phillipstown, White, Neff 1 Garner	36-4s-10e	Aux Vases	2,953	168	10- 1-40
Inman, Gallatin, Colbeck 1 Egyptian T. & T.	19-8s-10e	McClosky	2,730	200	10- 8-40
Inman, Gallatin, Egyptian T. & T. 2 fee	16-8s-10e	Tar Springs		30	11-19-40
Belle Prairie, Hamilton, Kingwood 1 William Barnhill	3-4s-6e	McClosky	3,467	50 oil 80 water	11-19-40
S. W. Barnhill, M.I.O.U. 1 French	4-3s-8e	McClosky	3,490	248	11-12-40
Dale, Hamilton†, Kingwood and Exchange 1 Prince	31-5s-7e	McClosky	3,126	148 oil 26 water	12- 3-40

*Million cubic feet of gas. †Extension.

Illinois Activity Concentrated On Eastern Side of State

(Continued from Page 15)

past month. Other counties in the area have generally shown over 100 per cent increase in oil completions with the exception of Wabash County which a year ago was enjoying more active development. There have been almost 900 oil wells completed in the area during the past year.

Initial production of the wells in the area varies widely according to the locality and the producing horizon. The McClosky lime wells have a higher initial due to the nature of the reservoir rock, but the sand wells are of equal importance because of their ability to produce over a longer period. A 1,500-bbl. McClosky well in the area is considered good while a 500-bbl. sand well is very well received. Over the past year the average initial of oil completions has been as follows: White County 170 bbl., Gallatin County 65 bbl., Wabash County 159 bbl., Wayne County 245 bbl., Edwards County 418 bbl., Hamilton County 201 bbl., and Franklin County 270 bbl.

At the present time, exploitation is definitely on the upswing as most of the operators in the area are hurrying to complete as many wells as possible before the winter weather sets in. The territory along the Wabash River is flooded for several months of the year and all automobile and truck traffic is practically barred from some of the fields. In most of the remaining part of this area the country is roughly rolling and it is almost impossible to get machinery over the hills and into the location during the winter.

Latest report from the area shows there are a total of 168 active operations in the area with 14 in Wayne County, 95 in White County, 8 in Edwards County, 15 in Wabash County, 2 in Gallatin County, 30 in Hamilton County and 4 in Franklin County.

TABLE 2—COMPARATIVE PRODUCTION IN SOUTHEASTERN ILLINOIS FIELDS

		Jan. 1, 1940		Nov. 1, 1940		
Field, county—	Twp.-Rge.	Prod. wells	Dly. av. prod., bbl.	Prod. wells	Dly. av. prod., bbl.	Drlg. oper.
Aden, Wayne	3s-7e	5	180	5	357	0
Albion, Edwards	2s-10-11e	..	....	47	8,882	14
Barnhill, Wayne	2s-8e	44	2,377	56	1,819	4
Boyleston, Wayne	1-2s-7e	26	1,063	68	4,863	6
Burnt Prairie, White	3s-9e	..	....	11	618	0
East Calvin, White	3-4s-10e	1	35	49	3,456	49
Centerville, White	4s-9e	..	....	3	237	1
Cowling, Edwards	2-3s-14w	7	115	7	134	0
Dale, Hamilton	6s-7e	..	....	17	1,248	2
Griffin, Wabash	3s-14w	37	869	82	7,956	15
Grayville, Edwards and White	3s-11e, 14w	7	517	6	111	0
Herald, White	7s-9e	..	....	3	39	0
Hoodville, Hamilton	5s-6e	..	....	13	1,733	21
Inman, Gallatin	8s-9e	..	....	1	10	2
Irons, White	6s-8e	..	....	39	3,791	3
Junction, Gallatin	9s-9e	8	260	14	397	0
Keensburg, Wabash	2s-13w	91	5,187	136	3,126	0
Lancaster, Wabash	1-2n-3w	..	....	28	1,270	1
Leech Township, Wayne	3s-9e	10	346	16	259	0
Maud, Wabash	1s-13w	..	....	4	196	2
Mill Shoals, White	3s-8e	27	1,450	45	1,783	11
Mount Carmel, Wabash	1s-12w	1	9	3	93	2
New Harmony, White	5s-14w	..	....	51	4,104	23
North Aden, Wayne	2-3s-7e	61	2,345	66	2,705	0
Phillipstown, White	4-5s-10e	2	101	5	188	2
Roland, White	7s-8e	..	....	1	15	0
Stokes, White	6s-8, 9e	10	642	10	168	0
Storms, White	6s-9e	25	1,088	100	5,790	9
Thompsonville, Franklin	7s-4e	..	....	...	....	6
Total		362	15,566	886	56,234	153

Heavy Demand for Texas Crude Despite Market Conditions

(Continued from Page 13)

tion is creating a serious problem, particularly in the Corpus Christi area, where, he asserted, the products from distillate plants are being marketed at lower prices than the field prices for crude oil. He estimated the volume of distillate gasoline output in the Corpus Christi area alone at more than 11,000 bbl. daily, and stressed the fact that while production of crude wells is being greatly restricted, distillate wells "across the fence" are being permitted to run wide open. He urged that some steps be taken to correct the situation, and offered a "sporting proposition" that if distillate producers would shut in their wells in the Stratton-Agua Dulce area for a time, his company would shut in its production in the King field, where the company is the sole producer, and also its wells in the Stratton area.

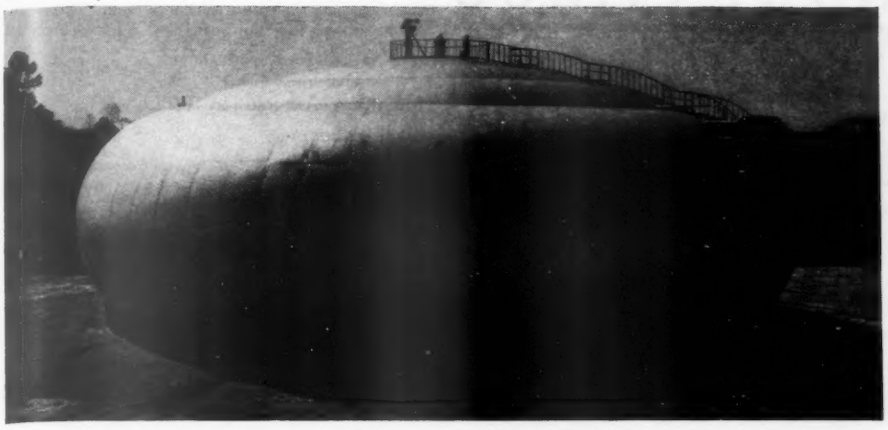
A proposal presented during the hearing that the Railroad Commission call upon Republic Oil Refining Co. to explain the conditions in the Corpus Christi area that prompted the company to reduce its posted prices for crude was turned down by the Commission on the grounds that the action of that company was something over which the commission had no authority, and thus it would be needless to discuss the matter. That company, however, in a statement issued at the time of the reduction, effective December 5, gave as its reasons the unfavorable refinery-market situation on the Gulf Coast which had for some time held prices for refined products below normal and also much less than actual cost, and the increasing availability of substantial quantities of crude to its competitors at considerably lower prices than the postings the company had tried to maintain.

Request was made by Amsco Pipe Line Co. to be relieved of 5,000 bbl. daily of crude it has been running from the Luby field, Nueces County (Corpus Christi district). Amsco, it was explained, had been taking this crude under a contract it made with the producers in the field at a time it had an export market for the oil, but since then it has lost this market and has been forced to dispose of the oil in whatever way it could. This company no longer wants the oil, it was stated, although Humble Oil & Refining Co. lately has been taking it off its hands. Luby, along with a number of other fields in the Corpus Christi area, has been mentioned frequently as one of the principal sources of crude moving below posted prices.

Allowable production, as reported by the Railroad Commission, for the week ended December 14, averaged 1,360,124 bbl., which was an increase of 6,276 bbl. over the previous week, and 83,124 bbl. above the 1,277,000-bbl. estimate of market demand by the Bureau of Mines. Discounting the normal 3 per cent under-production, which was estimated at 47,609 bbl., the excess over the Bureau's estimate was 35,515 bbl.

Also, all companies which advanced posted dealer prices of gasoline over Texas following the lead of the Texas Co., effective December 3, have returned to their former schedules, including the latter company. The advance was initiated by the Texas Co. in an effort to eliminate some of the disparity that had existed between crude and refined-crude and refined-product prices. Of the larger companies, only Gulf Refining Co. did not advance its prices. The latter company, however, is the largest marketer of gasoline in the state, and with this company and most of the smaller companies failing to move up their prices, the others were unable to maintain their new levels.

Natural Gasoline



A 100,000-bbl. Hortonspheroid, recently completed for Warren Petroleum Corp. at its Norsworthy, Texas, terminal near Houston, gives the company unusual flexibility in meeting a variety of natural-gasoline specifications and also adds materially to the company's ability to store large quantities of natural gasoline along the Gulf Coast. This tank has taken its position at the terminal site to handle 26-lb. natural and thus relieves other tankage for lower-pressure grades. In all, Warren has more than 1,500,000 bbl. of owned and leased storage tankage at Norsworthy. This pressure tank is 141½ ft. in diameter and 40 ft. high

Natural-Gasoline Production Increased During October

Production of natural gasoline in the United States increased in October 1940 according to the monthly report of the Bureau of Mines. The daily average in October was 6,838,000 gal. as compared with 6,588,000 gal. in September. The outstanding increases occurred in the Appalachian, Texas Gulf, Kettleman Hills and Oklahoma districts. Production in the Appalachian district totaled 6,834,000 gal. for October; in Illinois, Kentucky and Michigan, 3,873,000 gal.; Oklahoma, 35,566,000 gal.; Kansas, 5,674,000 gal.; Texas, 87,324,000 gal.; Louisiana, 9,338,000 gal.; Arkansas, 3,156,000 gal.; Rocky Mountain, 8,694,000 gal.; and California, 51,515,000 gal.

Stocks of natural gasoline continued to decrease, the total on hand at the end of October was 275,898,000 gal., compared with 295,596,000 gal. in storage on September 30, 1940, and 215,880,000 gal. a year ago. Stocks at refineries declined from 144,480,000 to 137,088,000 during October, while inventories at plant and terminals were reduced from 151,116,000 gal. on September 30 to 138,810,000 gal. on October 31.

Shipments to jobbers continued to increase, the total for October being 29,190,000 gal., compared with 22,302,000 gal. in September. Exports continued to decline and were only 1,806,000 gal. in October as compared with 7,476,000 gal. in September. The vapor pressure for all shipments except exports increased. The weighted average for the month was 18.7 lb. compared with 17.8 in September and 19.9 in October 1939.

Recycling Plant for Katy Gas Field Planned

HOUSTON, Tex.—Construction of a recycling plant in the Katy gas field, Waller County, Texas Gulf Coast, which has been under consideration for the past several months, is expected to be announced in the near future. The plant will be operated on a cooperative plan by the principal leaseholders in the field. These include Humble Oil & Refining Co., Stanolind Oil & Gas Co., Union Producing Co., Sinclair Prairie Oil Co., Magnolia Petroleum Co., Tide Water Associated Oil Co., Darby Petroleum Co., Sun Oil Co., Lion Oil Refining Co., Houston Oil Co., and the Amerada Petroleum Corp.

News of Pipe-Line Activity, which was formerly found on this page, will be found on Pages 50-51.

Refinery News

Shell to Add Additional Storage on East Coast

NEW YORK.—Additional gasoline and fuel-oil storage facilities totaling 35,000,000 gal. will be built by Shell Oil Co., Inc., at Atlantic Coast points during the next few months, N. J. McGaw, vice president in charge of transportation and supplies, has announced. These tanks, to be located in the New York and Boston areas, will provide for a substantial increase in the reserve of petroleum products carried on hand in these high-demand areas as protection against possible interruption of supply from refinery points. The desirability of such additional reserves in the interest of national defense was recently emphasized by the National Defense Council.

The significance of this added reserve, available at the point of consumption, is brought out by the fact that it would require approximately 6 months' continuous operation of an average oil tanker to supply metropolitan New York and Boston with this quantity of gasoline and fuel oil from Gulf Coast refineries.

Mid-Continent Independents Continue Fight for Lower Freight Rates

OKLAHOMA CITY, Okla.—Executives of most independent refining companies in the Mid-Continent area met here last Thursday and took steps to cooperate and aid the traffic representatives who have been directing the efforts of the Petroleum Rail Shippers Association in its fight for better train-load rates. Their campaign, directed through case No. 28106, would demand a 15-cent per hundredweight reduction from present single-car rates.

An executive committee was named, composed of Rex H. Winget of Cushing Gasoline Refining Co., Cushing, Okla., as chairman; R. L. Tollett, Cosden Petroleum Corp., Big Spring, Tex.; A. Danciger, Danciger Oil & Refineries, Inc., Tulsa; L. H. Prichard, Anderson-Prichard Oil Corp., Oklahoma City, and H. E. Zollar, Derby Oil & Refining Co., Wichita, Kans.

It was voted for this committee to become the clearing house through which the traffic counsel and representatives will handle future activities in bringing about a final decision of case No. 28106 and otherwise safeguarding the interests of the Mid-Continent independent refiners in any development that may arise in this or other transportation adjustment.

New Construction Adds to Wyoming Plant Capacity

CASPER, Wyo.—New construction under way or completed recently at Wyoming refineries will result in that state's refining capacity being boosted slightly. At Casper, the Riverton Oil Co. is installing new equipment that will raise the plant's capacity to 2,500 bbl. daily, erecting 10,000-bbl. storage for refined products, building a new loading rack and adding new pumping equipment. About 1 mile north of Laramie along the Lincoln Highway, Albany Oil & Refining Co. last week placed in operation a 500-bbl. skimming plant.

Shamrock Adding Equipment At Panhandle Refinery

AMARILLO, Tex.—Shamrock Oil & Gas Corp. has started a $150,000 expansion and modernization program at its McKee refinery in Moore County, Texas Panhandle. The work being done includes storage tanks, boiler house, pipe lines and other equipment. The McKee plant has a crude capacity of 2,500 bbl. daily, and includes a 1,500-bbl. cracking plant and polymerization unit.

Natural Gas

Outlet for Ottawa Gas Reserve Sought by Michigan Company

LANSING, Mich.—West Michigan Consumers Co., of Muskegon, Mich., has made application with the Michigan Public Service Commission here to construct a 6-in. gas line into Wright and Polkton townships, Ottawa County, where there is a gas reserve semiproved, according to the Consumers company. The company has a big industrial gas market in Muskegon which it has been supplying from the Muskegon-Ravenna fields and with gas stripped from Traverse wet gas from the Walker-Tallmadge fields, Kent and Ottawa counties. The proposed line would tie into the main Grand Rapids-to-Muskegon line.

Colorado Interstate Gas Rate Hearing Continuing at Denver

DENVER, Colo.—Hearings on the rates of the Colorado Interstate Gas Co. are continuing here, with the firm presenting additional evidence concerning valuation to justify its earnings. Total evaluation of the company's properties, together with those of the Canadian River Gas Co., producing concern, as presented to date amounts to some $18,698,945. Latest testimony offered consists of contracts for purchase and sale of the natural gas, which contracts were valued at $2,589,607, it was testified by William A. Lusk, chief accountant of the firm of Ford, Bacon & Davis, Inc., of New York.

Pipe-line properties of the two companies have been valued at $16,109,338 for the hearings. Earnings of the Colorado Interstate firm in 1939 netted $2,452,404 it has been stated; which, based on the 8 per cent of the investment which has been conceded as proper, would make a total valuation of around $30,000,000 necessary for the company's properties in order to justify current rates.

Concerning the evaluation of reserves, it has been testified that in 1939 the Canadian River Gas Co. produced 41,791,261,000 cu. ft. of gas from its properties in the Panhandle gas field.

PROGRAMS AND MEETINGS

Mid-Continent Oil Men Reelect Officers

Cooperation of the Mid-Continent Oil and Gas Association in meeting whatever demands are made upon the petroleum industry in the national-defense program was pledged at the annual meeting of directors in Tulsa, December 16.

Wallace Hawkins, Magnolia Petroleum Co., Dallas, Tex., was elected vice president for Texas succeeding W. H. Francis, who declined to accept the position again because of increasing business duties.

All other officers of the general association were reelected. They are: J. C. Hunter, Abilene, Tex., president; J. D. Collett, Fort Worth, Tex., chairman of the board, and Clarel B. Mapes, Tulsa, secretary-treasurer. Robert S. Kerr, Oklahoma City, Okla., first vice president; D. W. Harris, Shreveport, vice president for Louisiana-Arkansas; Ralph O. Pryor, Wichita, vice president for Kansas; F. O. Prior, Tulsa, vice president for Oklahoma, and Van S. Welch, Artesia, vice president for New Mexico.

Directors endorsed activity of the Interstate Oil Compact Commission and pledged support of the enlarged program.

Rocky Mountain A.P.I. Committee Holds Meeting in Casper, Wyo.

The Drilling Practice Committee for the Rocky Mountain district of the American Petroleum Institute held an all-day meeting in Casper, Wyo., on December 14. Papers read included "Possibility of Water Flooding in the Rocky Mountain Region," by Clark F. Barb, professor of petroleum engineering, Colorado School of Mines; "Application of New Well Treating Techniques," by P. E. Fitzgerald, chief geologist, Dowell, Inc.; and "Services Available to the Oil Industry in the Rocky Mountain District," by R. D. Copley, assistant manager, California Co. Herman F. Daviess, manager, California Co., is chairman of the committee.

Houston A.P.I. Chapter Holds Meeting and Golf Tourney

The Houston chapter of the American Petroleum Institute held its annual golf tournament and meeting at the Brae Burn Country Club, Monday, December 9.

Upon recommendation of the nominating committee, headed by C. E. Reistle, Jr., of Humble Oil & Refining Co., the following officers were elected to serve for the year 1941: Chairman, Paul L. Guarin, Shell Oil Co., Inc.; first vice chairman, Bowman Thomas, Humble Oil & Refining Co.; second vice chairman, J. U. Teague, Hogg Oil Co.; secretary-treasurer, Van D. Bennett, Bethlehem International Supply Co.

A chicken dinner was served in the evening to 162 members and guests and after the dinner R. E. Cogswell, Maintenance Engineering Corp., the winner of the golf tournament, was presented with a beautiful trophy by Paul Hubbard, chairman of the golf tournament committee. Gordon Richmond, of Hughes Tool Co., handled the arrangements for the dinner.

After the dinner, a program of entertainment and floor show was presented, under the direction of Fred A. Christanelli, Baroid Sales, who served as chairman of the entertainment committee.

Kentucky Geologists Organize New Society

ASHLAND, Ky., Dec. 16.—Advancement of the science of geology is the objective of the Kentucky Geological Society, formally organized last month. Charter members drew up plans for the organization in May 1940, but the society only came into being at a meeting in Lexington recently.

Election of officers, adoption of the constitution, a banquet, and interesting addresses marked the Lexington program.

Dr. A. C. McFarlan, department of geology, University of Kentucky, was elected president of the society. R. E. Stouder, geologist with the Louisville Gas & Electric Co., was named vice president. Coleman D. Hunter, chief of the department of geology and research, Kentucky-West Virginia Gas Co., of Ashland, was named secretary-treasurer.

The guest speakers were Kendall Born, of the Tennessee Geological Survey, Knoxville, Tenn., and Mrs. Louise Barton Freeman, of the Kentucky Geological Survey, Lexington.

All graduate geologists and petroleum engineers are eligible for membership, and all individuals interested in geology and the oil and gas industry are eligible for associate membership. All members of the society are also members of the Kentucky Academy of Science.

Seminole A.P.I. Meeting Attracts 200 Oil Men

More than 200 engineers, superintendents, and production men attended the regular monthly technical session of the Seminole chapter of the American Petroleum Institute, at Seminole, Okla., Monday night. A discussion on gravity conservation was preceded by a paper, "Fundamentals and Cures of Gravity Losses in Producing and Handling of Crude Oil," by Clarence Glasgow, National Tank Co., Tulsa. In addition, the group heard Rollie Inman, pilot for the O. C. S. Manufacturing Co., relate some of the sidelights of his recent stay in England, after ferrying a British bomber from Canada to England.

Mr. Glasgow pointed out that a loss in gravity of crude oil resulted in a loss in volume and that escaping fractions caused a reduction of 87,500 bbl. daily in crude production, according to some estimates. By preventing vaporization of the crude oil, this loss may be almost entirely eliminated. Mr. Glasgow then outlined the factors affecting vaporization of crude oil and the places in the production system where these losses were most likely to occur. Prepared and informal discussion followed.

The Seminole chapter of the A.P.I. is headed by Coxey Evans, Cities Service Co., with M. A. Wright, Carter Oil Co., first vice chairman; V. A. Kelley, Sargent Engineering Corp., second vice chairman, and J. J. Dillon, Cities Service Co., secretary and treasurer. The group was organized in May and now has a membership approaching 200 with the average attendance at the meetings of over 250. A separate phase of oil production is discussed at each meeting.

Mr. Inman was prevented by his agreement with the British Government from a full discussion of the war situation. He said that business went on as usual during the daytime but at night everyone had to seek shelter.

CALENDAR

December

GEOLOGICAL SOCIETY OF AMERICA, fifty-third annual meeting, University of Texas, Austin, Tex., December 26-28.

1941

January

SOCIETY OF AUTOMOTIVE ENGINEERS, annual meeting and engineering display, Book-Cadillac Hotel, Detroit, Mich., January 6-10.

LOUISIANA ENGINEERING SOCIETY, annual meeting, St. Charles Hotel, New Orleans, La., January 10-11.

LIQUEFIED PETROLEUM GAS ASSOCIATION, eastern section, regional meeting, New York, January 16-17.

COMPRESSED GAS MANUFACTURED GAS ASSOCIATION, INC., annual meeting, New Nork, January 20-21.

NORTHWEST PETROLEUM ASSOCIATION, Radisson Hotel, Minneapolis, Minn., January 23-24.

Michigan Association Will Elect Officers

Michigan Oil and Gas Association directors will elect officers December 19 at the Saginaw club. The board's personnel was selected at a meeting December 9 at Mount Pleasant, when it was decided that the past presidents automatically would become honorary life directors and A. J. Weideman, executive secretary, submitted the annual report.

Past presidents becoming honorary directors are: Howard D. Atha of Mount Pleasant, Floyd A. Calvert of Saginaw and H. M. McClure of Alma, who will retire after the December 19 election.

Directors elected for 2 years are: W. P. Clarke of Saginaw, Kurt H. DeCousser of Lansing, W. B. Pardoe of Grand Rapids, C. A. Smith Jr. of Grand Rapids, Edward Stewart of Mount Pleasant, George B. Talbot of Saginaw, W. A. Thomas of Mount Pleasant, C. M. Ashley of Grandville, Samuel L. McCall of Detroit and W. C. Taggart of Big Rapids.

Named for 1-year terms are: Dr. Virgil R. D. Kirkham of Saginaw, Alvin H. Weber of Bay City, George W. Scheid of Mount Pleasant, Clarence E. Welsh of Grand Rapids and S. J. Higelmire of Clare.

President McClure expressed appreciation for growth of membership and increased financial stability of the association and it was decided that the legislative committee headed by Mr. Calvert will present a bill to the 1941 state legislature seeking to have royalties defined in terms of the Michigan intangible tax law. The bill will propose that in its relation to lease and mineral rights in the oil and gas industry, such rights would be exempt from listing as intangibles.

Refinery Traffic Men Elect Officers for Coming Year

Members of the Western Pennsylvania Refiners Traffic Association elected officers for 1941 at a meeting last week in Oil City. They include: President, L. I. Gamble, traffic manager, Daugherty Refining Co., Petrolia; vice president, E. E. Brumberg, independent plant of the James B. Berry Co., Oil City; secretary, W. W. Schoenfeld, traffic manager, Pennsylvania Refining Co., Butler; treasurer, George W. Ebert, traffic manager, James B. Berry and Quaker State Oil companies of Oil City.

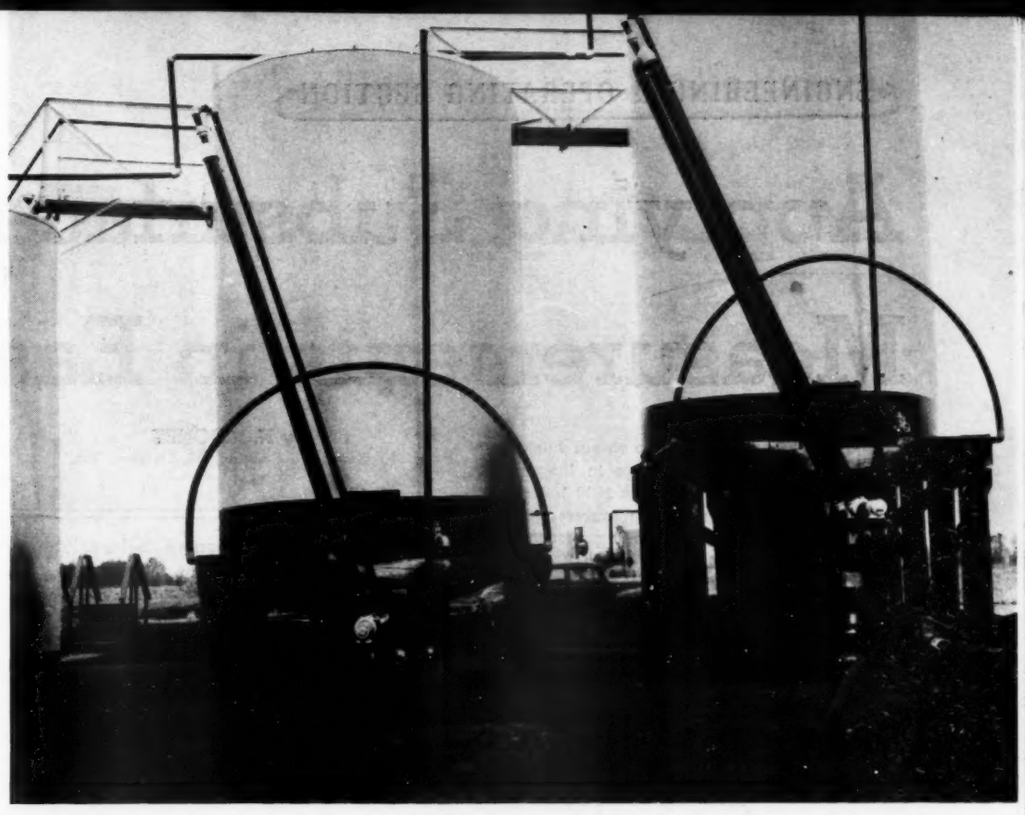
Engineering Club Hears Paper On Well Logging

An instructive lecture was given December 6 before the Texas A. & M. Petroleum Engineering Club by R. W. Wilson, manager, Baroid Well Logging Service. The subject of the address was "The Baroid Method of Well Logging."

Mr. Wilson demonstrated his lecture with camera slides. He was assisted by R. C. Marr, also of Baroid.

Form New Oil Group

The East Texas Liquefied Petroleum Gas Association is the name of a new organization launched last week at a meeting in Gladewater, Tex. Officers have not been elected, nor permanent headquarters announced, pending receipt of a charter from the secretary of state in Austin, Tex. N. L. Robinson, Gordon Box, and H. C. Pittman, all of Tyler, Tex., have been named to make charter application, and W. M. Foster, of Marshall, Tex.; Robert Hutson, of Lufkin, Tex., and A. A. Pickens, of Tyler, have been named as a committee to work out recommendations for increasing safety in making and using butane-gas systems for industrial and residential purposes.



Closed systems of salt-water treating require that all air be excluded from the brine. One of the most difficult points of accomplishing this is at the separation tanks. In Illinois one company uses the method illustrated here for this purpose. The flow regulators are made U-shaped from 3-in. pipe. The arc made by the 2-in. pipe is used to bolt the regulator to any desired position. To prevent siphoning of the tank, a 1½-in. gas connection is placed at top; keeping a 4-oz. gas pressure at this point

ENGINEERING & OPERATION

In This Section

DECEMBER 19, 1940

APPLYING SUBSURFACE-PRESSURE MEASUREMENTS IN EAST TEXAS
By N. N. Jones ..... Page 30

Data resulting from subsurface-pressure measurements is widely used by practical operators, as well as research engineers, in estimating reservoir conditions and in well studies. Three types of bottom-hole-pressure instruments are briefly described, the data obtained by these instruments discussed and practical uses to which these measurements have been applied in East Texas pointed out, including their use in studying gas-lift installations.

REMOVING MERCAPTANS FROM CRACKED GASOLINE TO IMPROVE STABILITY
By D. L. Yabroff, E. L. Waters, A. C. Nixon, and H. B. Minor ..... Page 35

In evaluating the influence of any treating process on stability, it is important to separate the effect of the particular process itself and the effect of the natural inhibitors that may be present. A method for doing this is presented, based upon the "basic inhibitor susceptibility" of the gasoline. Also the general aspects of gasoline sweetening, and the effect of solutizer sweetening in particular are discussed.

NEW TYPE SECONDARY RECOVERY DEVELOPED IN ST. LOUIS POOL
By T. P. Sanders ..... Page 39

In the St. Louis pool of Oklahoma trapped oil, which otherwise would have been lost, is being washed into the wells through use of large-volume centrifugal pumps to handle water that has encroached into the Simpson dolomite oil zone. Many new wells have been drilled in water-invaded areas of the field for the purpose of applying this recovery procedure.

NAPHTHA POLYFORM AND GAS REVERSION PROCESSES
By J. E. Bogk, P. Ostergaard, and E. R. Smoley ..... Page 43

High yields of motor fuels with octane numbers of 70 to 80 are obtainable from gas-reversion and polyform operations. Theoretical discussion of improved gas-naphtha conversions results obtainable in these processes is presented, and operating flow sheets and data on commercial operations of plants that have been in operation for some time are given.

SAFETY: Knowledge of Chemical Reactions Aids Welders ..... Page 38

Applying Subsurface-Pressure Measurements in East Texas

By N. N. JONES
Humble Oil & Refining Co., Overton, Tex.*

A.P.I.—Paper presented before East Texas chapter of the American Petroleum Institute, Division of Production, at Kilgore, Tex., December 10, 1940.

THE first-known attempts to obtain subsurface-pressure measurements were in Rumania in 1918 and 1919. However, it was 1930 before any real applications of pressure measurements were made in the oil fields. Bottom-hole pressures were first taken in the East Texas field in 1931. At the present time there are 15 companies and individuals operating bottom-hole-pressure gages and one operating a fluid-level detector in the field.

A subsurface-pressure gage, commonly called a bottom-hole-pressure bomb, is very simple in principle and differs from a common pressure gage mainly in the respect that it must be small enough to be lowered into tubing or casing. It has the same essential parts as a recording pressure gage, i.e., (1) a case, (2) a spring or Bourdon tube, (3) a gage hand or stylus and (4) a clock to turn the chart. The gage is enclosed in a steel case, usually about 1¼ in. in diameter and 40 to 52 in. long. The principle of operation is similar to the well-known surface-pressure gage. Pressure is exerted on the pressure element causing it to move, which, in turn, moves the stylus (gage hand) and marks the amount of extension on the chart. The amount of extension is readily converted into pounds pressure by referring to the calibration curve of the particular instrument.

There are several different types of bottom-hole-pressure instruments, some of which are covered by patents. The three most common are the spring, Bourdon tube and diaphragm types. These differ primarily in the type of pressure element. Fig. 1 shows a spring type and Fig. 2 a Bourdon-tube type instrument.

The operation of the spring-type bomb is as follows: Well pressure acts upon piston *A* which is resisted by extension of spring *B*. The spring extension is recorded by a stylus *C* upon paper within the recording drum *D*. Clock *E* turns drum at constant speed. The operation of the Bourdon-tube type is different only in that the pressure extends the Bourdon tube instead of a piston and spring.

In most bottom-hole-pressure bombs a maximum recording thermometer can be attached to obtain the temperature of the fluid in the well.

Bottom-hole-pressure instruments usually are lowered into the well through a stuffing box using wire-line-measuring devices. The pressure at any point in the fluid column in the tubing of a well can be measured merely by lowering the bomb to that point.

Data Obtained by Subsurface-Pressure Instrument

The following information can be secured by the use of a continuous recording bottom-hole-pressure bomb.

1. Bottom-hole pressure (static and flowing). This is the hydrostatic pressure exerted by the column of liquid above the bomb plus that caused by the weight of gas plus the casing-head pressure.

2. Static and flowing gradients. This is the average weight of the fluid per linear foot in pounds per square inch between two points of known pressure.

3. The gas-oil contact or fluid level.

4. The water-oil contact. This is the point of division between oil and water in a column of fluid.

5. The productivity index is defined as the barrels per day of gross fluid produced per pound per square inch pressure drop in the producing sand.

6. Specific productivity index is the productivity index divided by the feet of producing formation exposed.

The productivity index or factor and specific productivity factor can, for most practical purposes, be considered a measure of the permeability of the producing formation.

Fig. 3 shows diagrammatic sketches of pressures in a well under static and equalized flowing conditions. The calculations illustrate how these pressures are used to determine the fluid levels and productivity factors. The sketch labeled "A" shows the well in static condition and "B" the same well flowing after it has reached an equalized condition or point of maximum drawdown producing 30 bbl. per hour. These sketches are not of an actual well, as it is seldom that identical pressures and fluid gradients exist in the casing and tubing.

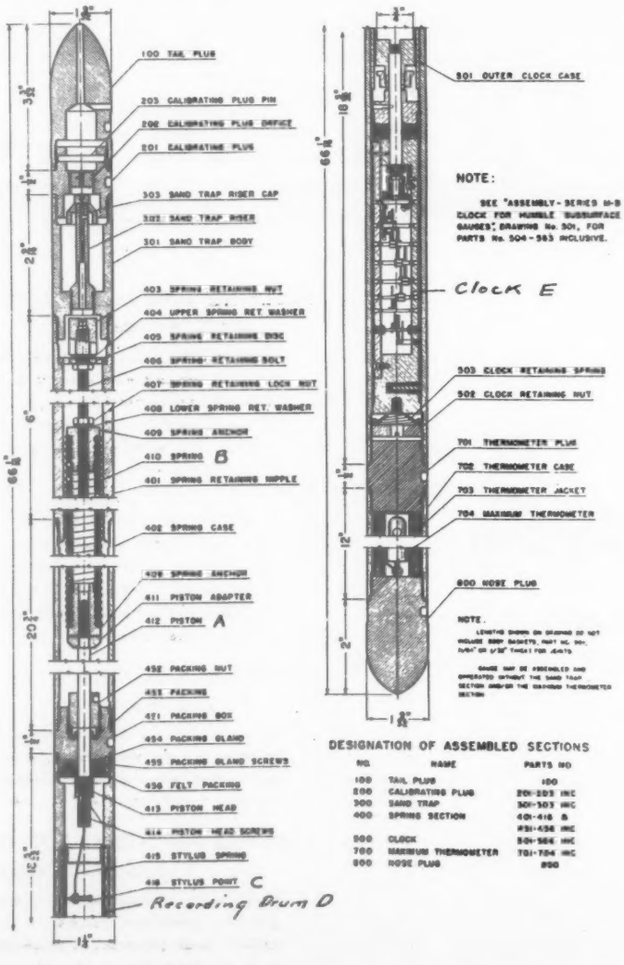


Fig. 1 (below)—Spring-type bottom-hole-pressure instrument. Fig. 2 (right)—Bourdon type bottom-hole-pressure instrument

*Paper presented under author's title of "Practical Use of Subsurface Pressure Measurements in East Texas."

Fig. 4 is a typical chart obtained from a continuous recording pressure gage. The operator's interpretation has been written in on the chart.

Figs. 5 and 6 are curves made up from information obtained from the chart shown in Fig. 4.

Fluid Level Determinations

Other devices used for determining subsurface pressures include the echometer and depthograph. These instruments are particularly adapted to application in pumping wells when it is not desired to remove sucker rods, or when it is desired to determine fluid level in the casing and subsurface pressure when wells are pumping. A sound wave is created by suddenly injecting gas into the annular space or by momentarily releasing gas from the casing or by firing a gun in a chamber connected to the annular space. Movement of the wave is affected by obstructions such as tubing collars, tubing catchers, liner tops, fluid level, etc., and variations in movement are reflected by recording instruments at the surface. By correlating time with the wave reflections and known positions of various obstructions, fluid level can be determined. Subsurface pressure can then be determined from the fluid level and weight of fluid.

Use of Subsurface Pressures as Applied to Whole Reservoir or Field

The data secured from subsurface-pressure measurements are used for so many purposes that it will be impossible to go into great detail on any of them in a limited time. In confining this discussion to the use of subsurface-pressure data in the East Texas field only, several very important uses of this information can be disregarded. The practical use of these data is first discussed as it applies to the whole reservoir or field.

Reservoir Performance

"The application of subsurface data to the results obtained from laboratory studies of the flow of liquid through porous media has made it possible to explain not only the water drive and past performance of the East Texas reservoir, but also to predict within reasonable limits of accuracy the future behavior of the average reservoir pressure," says Reistle. Numerous other writers have made use of bottom-hole-pressure data to explain conditions within the East Texas reservoir. In fact, for several years the greatest value of bottom-hole-pressure data accumulated was for the study of reservoir conditions as a whole.

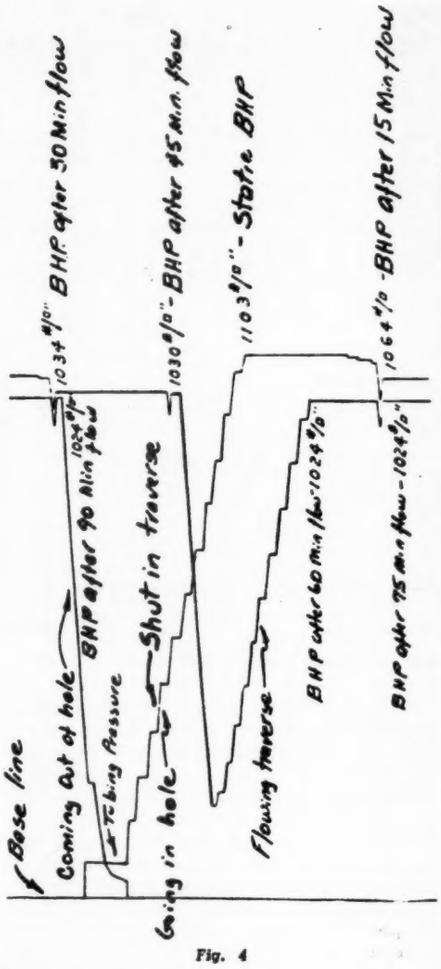


Fig. 4

The bottom-hole-pressure data accumulation in the field in its early life showed good maintenance of reservoir pressure, particularly in the western part of the field. This fact with steadily increasing water production from this area indicated a water drive from the west side of the field. "There is no doubt that water did encroach into the oil reservoir for, if the water had not moved in, the expansibility of the undersaturated remaining oil would permit less than 70,000,000 bbl. of production before the reservoir pressure would have been reduced to the saturation pressure of the oil; namely, 740 lb. per sq. in."

(Figs. 7 and 8, isobaric maps of the East Texas field with contours of the bottom-hole pressures during the last quarters of 1933 and 1940, are omitted.)

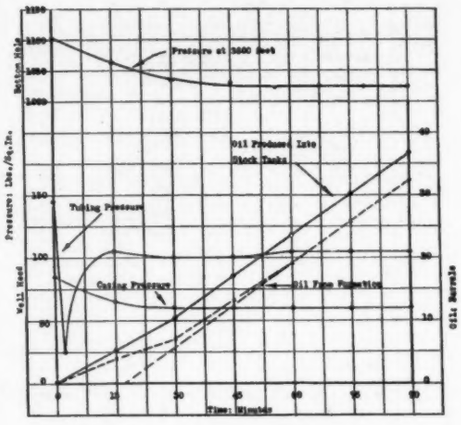


Fig. 5—A flowing well in East Texas

Total depth: 3,689 ft. Top of sand: 3,684 ft. Test depth: 3,600 ft. Elevation: 397 ft.; 7-in. 24-lb. casing; 2½-in. tubing; screen through sand section. Productivity factor: 7.7 B/D/lb. Specific productivity factor: 1.55 B/D/lb./ft. Flow rate: 25.6 B/hr.

The bottom-hole-pressure bomb has enabled the operator to determine the pressure drop in the reservoir surrounding the producing well. This gave the producer an actual diagram of the area drained by that well. Such data can be used to determine a practical spacing for future wells.

Figs. 9 and 10 are actual examples of the pressure drop in the reservoir surrounding a well in East Texas producing 961 bbl. per hour.

The data that these diagrams were drawn from were obtained by measuring the pressure drop with a bomb in the producing well and adjacent shut-in wells during a flow test.

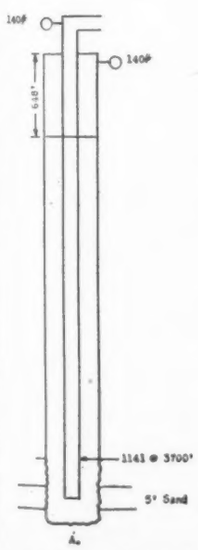
Application of Subsurface-Pressure Measurements to Individual Well Problems

It is the application of subsurface measurements to individual well problems that the aver age man in the field will find most useful. This is one place where he has control, and on the operation of the individual well or wells depends the profit or loss of the property. Here it is that bottom-hole-pressure data are applied by the production engineers, farm bosses and men in actual charge of securing the production in the field. The following are some practical applications of subsurface measurements to individual well problems.

Pumping Wells

From subsurface pressures the amount of fluid available is readily determined. This gives an accurate basis for the selection of pump and unit size. If after installation, production secured does not reach expectations, a check on bottom-hole pressure or fluid levels will show whether the pump is operating satisfactorily or if the trouble is due to lack of fluid coming into the hole.

In pumping wells, the use of fluid determinations by sound-wave reflections has excellent application. By the use of the sound-wave method, fluid levels are determined without removing rods from the tubing. If the weight per foot of fluid in the hole is known, the fluid levels can be con-



METHOD TO DETERMINE FLUID LEVEL

Formula:

$$\text{Test depth} = \frac{\text{B.h.p.} - \text{Surface pressure}}{\text{Gradient}}$$

Test depth 3,700 ft.
B.h.p. = 1,141 — Surface press. 140 lb.
Gradient .328 lb./ft.

$$\text{Fluid level} = 3{,}700 - \frac{1{,}141 - 140}{.328}$$

EXAMPLE OF CALCULATIONS SHOWING DETERMINATION OF PRODUCTIVITY FACTOR AND SPECIFIC PRODUCTIVITY FACTOR

After fluid level had reached its lowest point as indicated by bottom-hole pressure, the well produced 30 bbl. in 1 hour from the formation.

Bbl. per hour = 30.
Bbl. per day = 30 × 24 = 720.
Lb. press. drop = 1,141 — 992 = 149 lb.

$$\text{Prod. factor} = \frac{\text{Bbl. per day}}{\text{Lb./sq. in. press. drop}}$$

$$\text{Specific prod. factor} = \frac{\text{Prod. factor}}{\text{Ft. prod. formation}}$$

$$\frac{4.83}{5} = .966$$

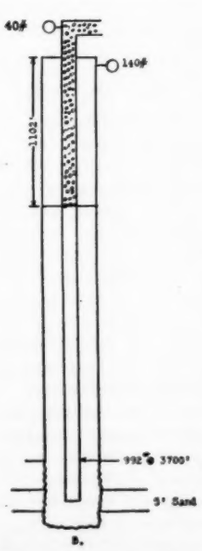


Fig. 3—Diagrammatic sketches of pressures in a well under static and equalized flowing conditions. Sketch "A," left, shows the well in static condition and Sketch "B" shows the same well flowing after it has reached an equalized condition or point of maximum drawdown producing 30 bbl. per hour

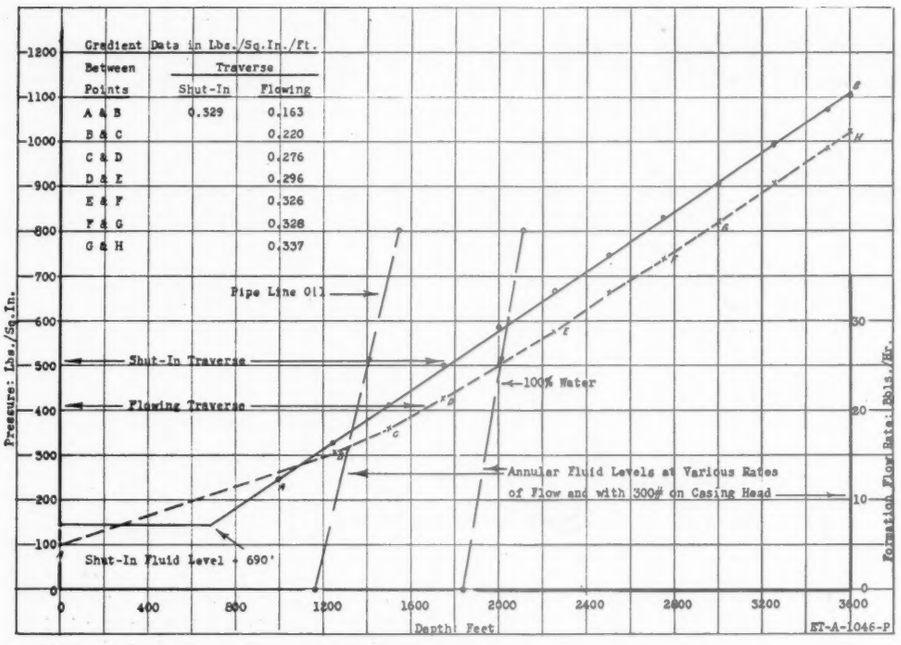


Fig. 6—Pressure traverses and annular fluid levels, August 1, 1940

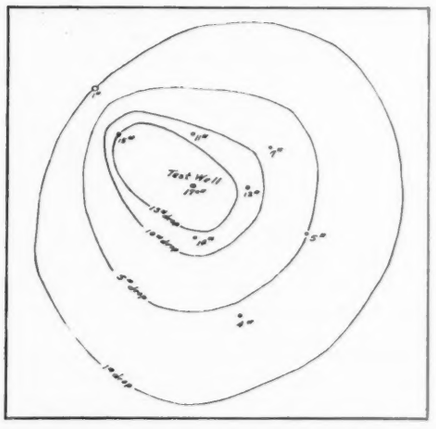


Fig. 9—Pressure contour map of an East Texas well showing the pressure drop in reservoir producing 961 bbl. per hour

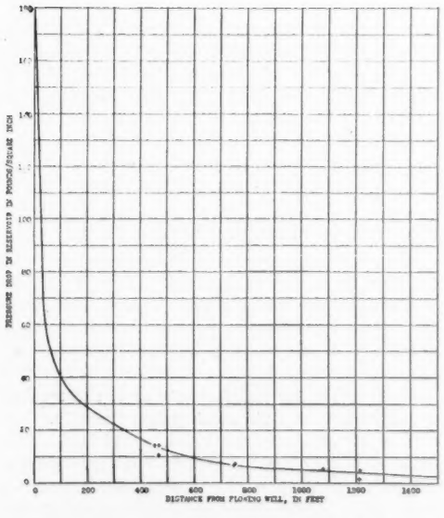


Fig. 10—Pressure drop in reservoir surrounding a well in East Texas field while producing 961 bbl. per hour

verted into bottom-hole pressures and the productivity index determined.

If fluid level is standing high above the working barrel and the pump is not delivering its known capacity, it is quite evident that trouble has developed in the pumping element. On the other hand, if fluid level in the casing is near the working barrel, it is evident the pump is handling all the fluid that is coming into the hole. This knowledge will save pulling pumping equipment for repairs or replacement with larger equipment when the equipment already in use is adequately handling all production available. Subsurface data are useful in determining whether "fluid pound" is being caused by lack of fluid in the well, by gas lock, or by standing-valve restrictions.

Gas-Lift Wells

Bottom-hole-pressure data have been used in East Texas to an advantage in designing and studying gas-lift installations. At the present, this is probably the most useful application of the bottom-hole-pressure bomb for the field man who has gas-lift operations. The bottom-hole-pressure instrument is now such an essential part of gas lift that some manufacturers of gas-lift equipment consider it necessary to operate their own bottom-hole-pressure bombs. I do not believe that any present-day manufacturer of gas-lift equipment would recommend the installation of his equipment in a well without some bottom-hole-pressure data on the well.

The operator who makes intelligent use of bottom-hole-pressure data can design more efficient and economical installations at the most ideal points in the tubing string. Costs of installations are reduced by eliminating unnecessary valves, and input-gas ratios are reduced by having the valves at the points to give the greatest efficiency. With the bomb the operator can determine, in an installation not operating satisfactorily, many sources of trouble which cannot be found by any other method. This enables him to make necessary corrections in the installation without resorting to the expensive "cut and try" method which oftentimes has caused some operators to condemn gas lift as a method of producing.

The design of gas-lift installations for differential valves requires the use of bottom-hole data to determine the location of the top valve, the flowing valve, the lowest valve, the equalizing devices and the space between the valves.

1. The top valve should be placed above the shut-in annular fluid level with the minimum casing pressure. It is necessary to have a valve exposed to the annular gas at all times so the valve can operate. The shut-in fluid level is found by plotting the shut-in gradient on coordinate graph paper with pressure against depth. The lowest casing pressure is extended to the shut-in gradient and annular fluid level at this pressure is indicated. (See Fig. 11, Curve 1.)

2. The flowing valve or port should be placed in the flow string just above the flowing annular fluid level after the well has equalized to secure the maximum efficiency. The flowing annular fluid level is determined from a productivity curve plotted with the rate of production against

(Continued on Page 85)

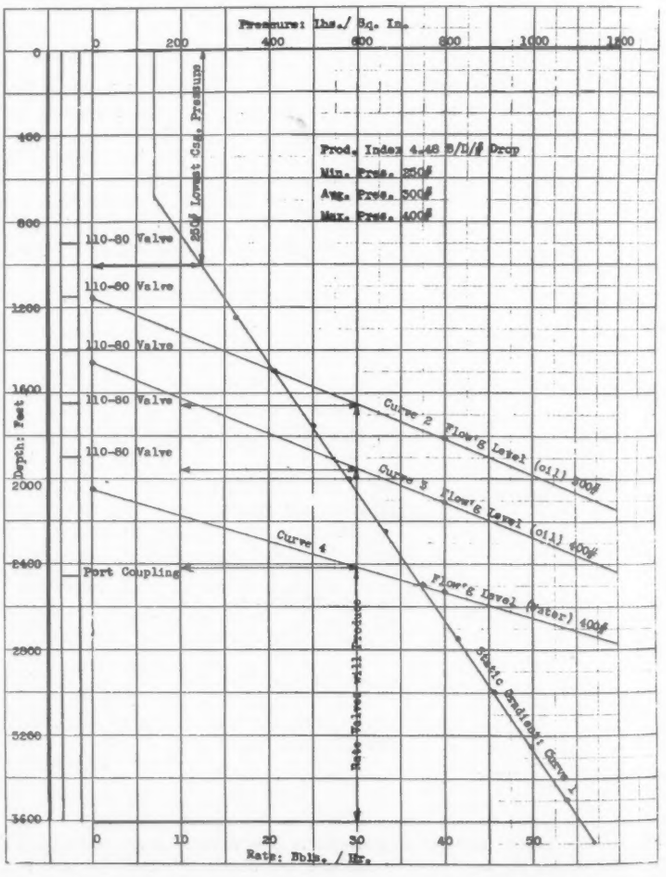


Fig. 11—Design of a gas-lift installation on a west-side well in East Texas

Removal of Mercaptans From Cracked Gasoline To Improve Stability

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The present article on the solutizer process discusses the general aspects of gasoline stability, and the effect of solutizer sweetening in particular. In evaluating the influence of any treating process on stability, it is important to separate the effect of the particular process itself and the effect of the natural inhibitors that may be present. A method for doing this is presented, based upon the "basic inhibitor susceptibility" of the gasoline.

This method of sweetening preserves the inhibitor susceptibility, whereas many other sweetening methods cause a degradation in this property due to the introduction of deleterious by-products.

THE solutizer process marks a distinct advance in gasoline sweetening because the mercaptans are removed completely from the gasoline instead of being converted to disulfides with the accompanying traces of polysulfides or soluble metal salts. The treating agent employed in the process is a strong caustic solution to which has been added a suitable organic material, termed a "solutizer," and this results in a caustic solution of "high solvency power" for mercaptans. Previous publications[1] have discussed the underlying theory of the process, the extraction and regeneration steps, the attractive improvement in octane number and lead susceptibility as compared to the untreated sour gasoline, pilot-plant studies, and finally the operation of a 15,000-bbl.-per-day commercial plant at the Wood River refinery of Shell Oil Co., Inc. In this paper we wish to discuss the effect of solutizer sweetening on the stability characteristics of the gasoline, with particular emphasis on the inhibitor susceptibility.

Stability of Cracked Gasoline

The stability of a cracked gasoline may be considered as arising from two main factors: inhibitors and refining. The role played by oxidation inhibitors, either the natural alkyl phenols or the various synthetics, is a very important one, and indeed can hardly be overemphasized. There is evidence to believe that refining processes such as acid or clay treating improve stability by conditioning the gasoline so as to improve its response to the action of inhibitors. This of course is done by polymerizing and removing the more unstable gasoline constituents. The importance of inhibitors becomes evident through the fact that we have never encountered a cracked gasoline, no matter how severely refined, that will pass the conventional stability tests after all of its inhibitor has been removed from it.

Now, in evaluating the influence of a given treating process on the stability characteristics of a cracked gasoline, it is important to be able to separate the effect of the particular process itself, and the effect of the natural inhibitors that may be present. Changes brought about simultaneously in the natural inhibitor content of the gasoline and in its stability may often obscure the real effect of the treating process, and may lead to erroneous conclusions. Failure to adequately take this factor into account has lessened the value of much published work.

In order to eliminate this troublesome variable, Newton,[2] in his study on acid treatment, resorted to the diazo reaction in an attempt to obtain gasoline samples entirely free of natural inhibitors. The induction period of the inhibitor-free gasoline was apparently used as the criterion for gaging the degree of refining obtained. A limitation of the diazo reaction, pointed out by Newton,[2] is that not all phenols will react in this manner, especially those that contain groups substituted in all three ortho and para positions.

In studying the stability of cracked gasolines, we have employed a particular solutizer solution in the laboratory to obtain inhibitor-free samples, and this procedure appears to be more effective for this purpose than the diazo reaction, as will be shown further below. Known amounts of given inhibitors are then added to the completely uninhibited gasoline and their effect on the induction period is determined. Such a procedure allows the evaluation of what we have called the "basic inhibitor susceptibility" of the gasoline in question, and the true effect of a given treating process on this property may therefore be readily determined. The susceptibility of a gasoline to inhibitor is a most important property, not only from the standpoint of actual inhibitor requirement, but also because it goes hand in hand with other stability characteristics of the gasoline. Indeed, we can go so far as to say that any treating process that improves the basic inhibitor susceptibility of the gasoline has also improved other stability properties; conversely, a decrease in the basic inhibitor susceptibility means an impairment of the gasoline stability.

The data of Table 1 show the extent to which natural alkyl phenol inhibitors may be removed with the diazo reaction and with our K-2 solutizer solution. The gasoline employed in these experiments was an acid-treated and doctor-sweetened full-range cracked gasoline. The diazo procedure was carried out according to the directions given by Newton.[2] The solutizer treatment was performed by cooling the gasoline to 0°C. and extracting in a separatory funnel with 10 per cent vol. of precooled K-2 solutizer (6N potassium hydroxide — 3N potassium isobutyrate). It will be noted in Table 1 that one solutizer treatment removed almost all of the natural inhibitors from the gasoline and complete removal was obtained by two such treatments. Three diazo treatments, on the other hand, did not remove all the natural inhibitors, and the induction period of the resultant gasoline was even slightly higher than that of the sample treated but once with K-2 solutizer. In the laboratory, two 10 per cent vol. extractions with the K-2 solution are generally employed to insure complete inhibitor removal. Because of its instability due to the absence of inhibitors, it is important to test or to reinhibit the K-2 solutizer-treated gasoline immediately.

The data of Table 2 are presented in order to show that the complete removal of inhibitors by the K-2 solutizer treatment has no other effect on the stability properties (except also to sweeten the gasoline simultaneously if it is sour). In these experiments a portion of the same gasoline used above was K-2 solutizer treated and then inhibited with 50 mg./100 ml. of 4T inhibitor. The 4T material is an alkyl phenol type inhibitor. The inhibited gasoline sample was then successfully extracted with K-2 solutizer and reinhibited. Comparing Items 3, 5, 7, and 9 of Table 2, it is seen that the effectiveness of a given amount of 4T inhibitor in this gasoline is not changed even by four solutizer extractions followed by reinhibition in each case.

Influence of Sweetening on Inhibitor

Data are presented in Table 3 for several different cracked gasolines, showing the effect of solutizer sweetening and plant doctor sweetening on the basic inhibitor susceptibility. In these experiments the sour and the corresponding plant doctor-sweetened gasolines were treated with K-2 solutizer which removed all natural inhibitors and simultaneously sweetened the sour gasoline. The effectiveness of known amounts of 4T inhibitor in the completely uninhibited samples was then determined. As shown in Table 3, the susceptibility of the solutizer-treated gasolines was much greater in every case than that of the doctor-treated gasolines. In order to reach an induction period of 300 minutes, starting with the uninhibited samples, the various solutizer-sweetened gasolines required only from 49 to 78 per cent as much inhibitor as the doctor-treated gasolines.

Solutizer treating may be considered as a mild refining since it removes mercaptans from the gasoline. However, it is likely that the reason for the higher inhibitor susceptibility of solutizer-

TABLE 1—REMOVAL OF NATURAL INHIBITORS FROM A CRACKED GASOLINE WITH THE DIAZO REACTION (2) AND WITH K-2 SOLUTIZER SOLUTION*

Number of successive treatments—	Induction period, min.† After diazo treatment	Induction period, min.† After solutizer treatment
None	395	
1	95	25
2	45	15
3	30	15
1 diazo followed by 1 solutizer	15	

*6N potassium hydroxide—3N potassium isobutyrate.
†At 100° C. and 100 lb. oxygen gage in U.O.P. type bombs. A 30-minute correction has been subtracted from the observed induction periods to correct for the heating-up lag of the gasoline in the bombs.

TABLE 2—REMOVAL OF INHIBITORS FROM A CRACKED GASOLINE BY SOLUTIZER TREATMENT, FOLLOWED BY REINHIBITION

Item No.	Gasoline treatment—	Induction period, min.
1	None—Original gasoline	395
2	Item 1, K-2 solutizer treated*	25
3	Item 2, plus 50 mg./100 ml. of 4T inhibitor	455
4	Item 3, K-2 solutizer treated*	20
5	Item 4, plus 50 mg./100 ml. of 4T inhibitor	465
6	Item 5, K-2 solutizer treated*	20
7	Item 6, plus 50 mg./100 ml. of 4T inhibitor	455
8	Item 7, K-2 solutizer treated*	20
9	Item 8, plus 50 mg./100 ml. of 4T inhibitor	455

*One 10 per cent vol. batch extraction.

TABLE 3—EFFECT OF SOLUTIZER SWEETENING AND PLANT DOCTOR SWEETENING ON THE BASIC INHIBITOR SUSCEPTIBILITY OF SEVERAL CRACKED GASOLINES

(Sour and plant doctor-sweetened gasolines extracted with K-2 solutizer to remove all inhibitors and to sweeten the sour gasoline. Known amounts of 4T inhibitor then added to completely uninhibited samples.)

Gasoline No.	Conc. of 4T inhibitor added back to uninhibited gasolines, mg./100 ml.	Induction period at 100° C. and 100 lb. oxygen, min.		Amount of 4T inhibitor required in uninhibited gasolines for a 300-min. induction period, mg./100 ml.		Ratio of inhibitor requirements, solutizer sweetened to plant doctor
		Sweetened by solutizer	Sweetened by plant doctor	Sweetened by solutizer	Sweetened by plant doctor	
1	0	10	10			
	20	235	145	28	51	0.55
	40	375	250			
2	0	35	25			
	20	380	325	14	18	0.78
	40	605	570			
3	0	10	10			
	20	330	180	18	37	0.49
	40	520	320			
4	0	15	15			
	20	300	200	20	31	0.51
	40	525	375			

sweetened gasoline is to be attributed largely to the fact that no deleterious products are introduced during the course of sweetening. Solutizer sweetening therefore preserves the inhibitor susceptibility and other stability properties of the gasoline, while many other sweetening methods bring about a degradation in these properties.

"Mixed" Solutizers Leave Natural Inhibitors in Gasoline

From a practical point of view, the presence of alkyl phenols in gasoline is desirable, and we wish to retain at least a portion of them in the treated product. This is done by employing a so-called "mixed" solutizer which contains both isobutyrate and alkyl-phenolate salts. A typical solution of this type, designated as K-20, has the following composition: 6N free KOH — 1.5N potassium isobutyrate — 13.5 per cent vol. alkyl phenol (as the salt). The gasoline sweetened with such a solution contains a more or less definite amount of alkyl phenols because of the equilibrium established with the alkyl phenol salts in the solutizer solution itself. Experiments have shown that this equilibrium amount of alkyl phenols in the gasoline is about 0.02 per cent vol. for the K-20 solutizer. The effectiveness of this amount of alkyl phenol as an inhibitor in a given gasoline depends on the inhibitor susceptibility. This latter property is of course affected by the extent of the previous refining of the gasoline, the presence of certain deleterious impurities, the gasoline composition, etc.

TABLE 4—EFFECT OF TREATING WITH A "MIXED" SOLUTIZER (CONTAINS BOTH ISOBUTYRATE AND ALKYL PHENOLATE) ON THE INDUCTION PERIOD OF CRACKED GASOLINES

Item No.	Induction period at 100° C. and 100 lb. oxygen, minutes	
	Untreated sour gasoline	After treatment with K-20 solutizer
1	40	525
2	70	315
3	75	100
4	75	185
5	75	740
6	95	225
7	110	355
8	125	335
9	150	260
10	270	220
11	305	300
12	315	130

In many cases, the amount of alkyl phenols imparted by the K-20 solution may be more than sufficient to assure adequate stability. In the case of some poorly treated gasolines it may be necessary to add further amounts of inhibitor. This is illustrated by the data of Table 4 which gives the induction periods of a number of sour cracked gasolines, before and after treatment with the K-20 solution at room temperature. As expected, there is no relation between the induction period of the untreated and the solutizer-treated gasoline, since the latter is dependent essentially on the inhibitor susceptibility of the gasoline. It will be observed that the induction periods of the treated samples range from 100 minutes to as high as 740 minutes. The properties of the gasolines of Table 4 are listed in Table 5.

In the commercial application of the solutizer process, we therefore use a solution of the mixed type when treating full-range cracked gasolines in order not to extract all of the natural inhibitors from the gasoline. When treating straightrun gasolines, a straight isobutyrate solution (such as K-2) is employed. Low-boiling cracked gasolines or reformed gasolines that contain no natural alkyl phenol inhibitors are often treated with the straight isobutyrate solution and then inhibited or blended with gasolines that do contain natural inhibitors. The 15,000-bbl.-per-day solutizer plant at Wood River uses the K-2 solution to treat a blend of full-range reformed and light-cracked and straightrun gasolines. The treated material is blended with a heavy-cracked gasoline that contains natural alkyl phenol inhibitors. Two new plants about to begin operation at the Martinez and Dominguez, Calif., refineries of Shell Oil Co., Inc., will treat full-range cracked gasoline and will employ a mixed-type solutizer solution for this purpose.

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TABLE 5—PROPERTIES OF THE GASOLINES OF TABLE 4

Item No.	A.S.T.M. distillation, °F.					A.P.I. gravity	Bromine number (3)	Sulfur, % wt., of sour gasoline	
	I.B.P.	10%	50%	90%	F.B.P.			Total	Mercaptan (4)
1	99	126	198	268	302	68.9	98	0.31	0.057
2	84	114	216	360	414	71.1	157	0.14	0.045
3	109	158	260	354	389	57.9	92	0.13	0.037
4	99	127	241	378	410	59.8	91	0.14	0.022
5	102	136	244	351	383	61.3	77	0.14	0.015
6	92	131	239	339	378	62.5	83	0.28	0.111
7	108	145	246	311	334	62.3	91	0.45	0.041
8	111	164	259	353	388	60.7	38	0.09	0.016
9	97	154	271	379	408	58.3	60	0.03	0.005
10	117	165	255	361	412	58.1	55	0.04	0.004
11	105	145	241	332	377	60.9	46	0.09	0.022
12	95	131	237	331	363	63.7	91	0.64	0.173

SAFETY - Knowledge of Chemical Reactions Aid Welders

OCCASIONALLY accidents occur which could only have been prevented by the injured man's having a wide and detailed knowledge of science. Their recurrence is a matter of pointing out the danger to others in similar circumstances. In an accident recently reported in Petroleum Safety, a very unusual injury was received by a workman.

The welder, in this case, was making a thermometer well to go into a line and was using a piece of 1-in. stainless steel pipe about 3 ft. long. After heating one end of the pipe, he bent it together and then welded it. Laying his torch to one side he picked up the piece of pipe and blew into the open end in an effort to give it a preliminary test for leakage.

Just as the welder blew into the pipe, an explosion occurred and the pipe was blown from his hand and shot across the room. Fortunately, the man's lungs were not injured by the explosion but he did suffer some superficial burns and one of his tonsils was most severely lacerated.

It is believed that a small amount of acetylene got into the tube while he was welding it. The amount of acetylene was sufficient to place it above the upper explosive limit so it did not burn but remained in the pipe. Dilution of the gas due to the oxygen in the man's breath brought the gas down into the explosive range and the red-hot weld supplied the source of ignition.

The only way of limiting the number of accidents of similar nature is for every welder to understand all the peculiarities of the materials with which he works. A safe policy to adopt would be one in which the workman never did anything until he was sure of the reaction produced. This is impossible as it would unnecessarily delay the work and then the workman might not have the correct answer. However, reasonable forethought before performing some task and detailed explanation of the accidents which do occur, will greatly aid in pointing out the more obvious dangers.

New Type Secondary Recovery Developed in St. Louis Pool

By T. P. SANDERS

IT is generally conceded that Oklahoma's future as an oil-producing state is dependent largely upon application of secondary-recovery methods to extend the lives of pools already producing. Secondary recovery implies the injection of gas or water to drive oil to the producing wells, but a new kind of secondary recovery has grown up in the St. Louis pool which does not call for the injection of an expulsive medium. By installing large-volume pumps to handle the water which has encroached into the Simpson dolomite oil zone, trapped oil which otherwise would have been lost is washed into the wells. Then, after the head on the encroaching water has been lowered through removal of fluid, the gas remaining in structural, stratigraphic, or porosity traps is given a chance to expand, thereby forcing additional oil to the low-pressure areas about the well bores. So successful has been this method of extending the productive life of the pool that about 180 new wells have been drilled as a direct result.

Official discovery of the St. Louis pool dates back to 1920, but since this discovery is credited to a very small edge well, activity in the area was not touched off until after completion of a large producer during the summer of 1927.

The drilling campaign was well under way in 1927, reached its peak in 1928, and tapered off in 1929. By January 1930 there were slightly more than 500 wells in the field, and the number remained fairly constant until the close of 1933.

Due to the wasteful character of oil-field development during the twenties, the peak gas production for the field was reached in February 1928, or only 8 months after the pool had been opened. At this time only 80 of the wells in the field had been completed.

After its peak was passed, gas production declined very rapidly, and simultaneously with this dissipation of gas pressure water appeared. As early as August 1929, 180 of the 341 wells, or over half of the wells which had then been completed, were producing appreciable volumes of water.

By the summer of 1933 the field was described as "drowned out." No new wells were being drilled and about 40 heavy water wells had been plugged because they were unable to operate profitably with their low oil recovery. The typical beam well produced something like 400 to 700 bbl. of water with 10 to 100 bbl. of oil.

Then came the new era in which the operators began to handle the large volumes of water encroaching into their wells. Bottom-hole electrical centrifugal pumps were installed, often capable of producing 3,000 bbl. of fluid per day. (For complete description of this equipment, together with reference data and charts, the reader is referred to Pages M-2, M-3, and M-9 to M-12 of the Producing Equipment Directory, 1940-41 Edition.)

Many operators were surprised to find that by handling greater volumes of fluid with the new equipment the oil-water ratios were increased. This result is apparent from data given in Table 1.

Drilling Booms Started by Pumps

The first of a series of small drilling booms was set off in 1937 following realization of the excellent results obtained by installing a centrifugal pump in Phillips 1 Richards, NE NE SE 35-7n-4e. The well had been producing on the beam 51 bbl. of oil per day with about 500 bbl. of water. The centrifugal pump increased production to 365 bbl. oil with about 2,000 bbl. water. This increase was made in February 1935. Since the production held up admirably well, Pioneer Drilling Co. undertook the drilling of a new well one location to the north. Completed in June 1937, this well produced 340 bbl. initially. With continued use of the large-capacity centrifugal pump its production rose to 435 bbl. daily with 2,100 bbl. water.

One location east of Phillips 1 Richards, Magnolia 1 Billington had been producing about 100 bbl. per day on the beam with 400 or 500 bbl. of water. Encouraged by the greater production to the west, a centrifugal pump was installed, resulting in an oil gain of over 400 bbl. daily.

With this more or less isolated group of three wells producing 1,200 bbl. per day, new wells were rapidly drilled on surrounding acreage. In all of these wells a new practice in well completion was to be noted. The wells were drilled deep, deliberately into portions of the dolomite which had been flooded by water. Production of water as well as oil was encouraged through use of acid. Centrifugal pumps with powerful electric motors were used to lift the large volumes of oil and water entering the well bores. In all, about 35 wells were drilled around the Richards lease where the new production practice had been discovered. The Richards well alone has recovered 407,000 bbl. of oil, or over 40,000 bbl. per acre.

Almost simultaneously with the drilling development about the Phillips' Richards lease another drilling boom was started in the same manner a mile to the north and east. The well in the southeast corner of Section 25-7n-4e had been pumping 10 bbl. of oil per day with the hole practically full of water. A new owner acidized it and installed a large-capacity centrifugal pump, thereby establishing a peak production of 600 bbl. of oil per day with about 2,000 bbl. of water. This success drew attention to the well one location south, which had been producing 7 bbl. of oil every 3 days with practically all water plugged off. In the hands of a new owner this well was drilled deeper and acidized to encourage the entrance of fluid, both water and oil. With a centrifugal pump installed it was found capable of making 500 bbl. of oil with 2,000 bbl. of water. This startling accomplishment led to the drilling of 12 nearby wells in which large volumes of water were handled to recover over 1,000,000 bbl. of oil.

In the southwest corner of 31-7n-5e another boom was set off when oil production was increased from 40 to 625 bbl. per day by drilling a well 50 ft. deeper in the water-invaded Simpson dolomite, acidizing it, and installing a centrifugal pump to handle the large oil and water production. As a direct result, 16 new wells were drilled on the surrounding leases, once more indicating that the profit motive is served through this handling of large water volumes.

In 1939 another small boom area developed at the northeast corner of 32-7n-4e. Deep Rock 1 Miller had been making 3 bbl. of oil per day. After deepening 70 ft., acidizing, and installing a centrifugal pump, the production was increased to 450 bbl. of oil and 2,200 bbl. of water per day. Seven wells were drilled as a result of this success. The four Nabors wells in Section 33 have recently been deepened into water and acid-treated. Although 1,000,000 bbl. of oil have been taken from this lease, the operators believe they will produce another 1,000,000 bbl. with continued use of the centrifugal pumps.

New Chapter Started

The first chapter in a new drilling boom may have been written last month in this area. Again it is the story of producing large water volumes to obtain profitable oil production. Reda Pump Co. 1 Lucas in NW 2-6n-4e had produced for almost 2 years on a centrifugal pump, but this had been removed in 1939 because the oil production had declined to about 60 bbl. per day with 2,500 bbl. of water. On the beam the well produced 15 bbl. per day with 600 bbl. of water. Then last month the largest size electrical centrifugal pump was installed in the hole. The first day's production was 235 bbl., but it has since increased to 265

TABLE 1—PRODUCTION CHANGES BROUGHT ABOUT BY INTRODUCTION OF LARGE-CAPACITY CENTRIFUGAL PUMPS

Company and well—	Prior to centrifugal pump		Production with centrifugal pump	
	Oil	Water	Oil	Water
Amerada Petroleum Co. 2 Harrison	40	900	110	1,850
Amerada Petroleum Co. 5 Harrison	35	780	135	2,000
Arkoma Oil Co. 1 Bean	60	500	400	1,800
E. J. Bowmaster 3 Brister	25	250	660	1,800
Creslenn Oil Co. 1 Mitchell	83	700	265	2,260
Carter Oil Co. 1 Monnett	50	400	430	4,020
Carter Oil Co. 2 Monnett	15	336	215	2,160
Denver Producing & Refining Co. 1 Richards	30	1,400	200	2,200
Mid-Continent Oil Corp. 2 Vieux	120	400	340	1200
Maebris Oil Co. 2 Brown	125	1,075	375	1,900
Magnolia Petroleum Co., 1 Billington	75	250	300	1,536
Magnolia Petroleum Co. 2 Billington	240	630	500	1,300
Magnolia Petroleum Co., 3 Hilton	50	600	260	2,000
Phillips Petroleum Co., 1 M. F. Reade	22	210	200	1,500
Phillips Petroleum Co. 4 N. Bruner	75	165	264	900
Phillaine Oil Co., 3 Garrett	500	600	1,187	1,200
Shell Oil Co., Inc. 1 Mitchell	100	500	489	1,600
Shell Oil Co., Inc. 2 Hines	100	600	372	1,380
Skelly Oil Co., 2 Decker	70	600	344	2,400
Sinclair Prairie Oil Co., 3 Gilbreath	100	325	450	1,500
Sinclair Prairie Oil Co. 2 Deatherage	140	500	400	1,400
Tilco Oil Co., 2 Wyatt	12	138	145	2,000

bbl. per day with almost 4,000 bbl. of water. Lifting this water caused a 55-bbl. increase in oil production at the well one location to the north (Reda 2 Monnett).

The three Reda Monnett wells have produced 818,000 bbl. No. 3 on this lease was nearly abandoned without setting casing because the Viola was found 121 ft. lower than at the well to the south. The Simpson dolomite was 75 ft. low. Decision was made to set casing only because it was realized that equipment was available to handle large volumes of water for a comparatively modest oil production. The initial production was 1,382 bbl. of oil per day with 480 bbl. of water. Decline was rapid, but the oil production stayed near 600 bbl. of oil per day for a long time.

Water-Drive Conditions

In some quarters it is contended that the handling of large volumes of water in this field has been economically justified only from the standpoint of competitive production between the leases, and that it could not have been considered sound practice had the field been operated by a single company or by a group of cooperating companies. In other words, it is said that the large-volume pumps handling the encroaching water succeeded only in producing oil on the flanks of the structure at a cost of say 60 cents per barrel which could have been recovered for 25 cents per barrel had the operators waited until it was moved by the water to the crest of the structure. Evidence available offers some support to this belief, the records showing that in at least one instance in which a large-capacity pump was installed, production at a well updip dropped off sharply. However, there is no proof that this effect existed over distances of more than one or two locations, and the following facts indicate that the field as a whole could not have reacted in this manner:

1. At the time the first electrical centrifugal pump was installed in 1933, water was not confined to the flanks of the structure but was in general distribution throughout the areal extent of the field. Nearly all wells were producing water and most of them were capable of producing far more water than equipment in use could handle.

2. The structural conditions in the Simpson dolomite are not represented by a regular anticline but rather by a complicated uplift of minor folds. Although the productive area is large, closure is small, and there are no steeply dipping or well-defined flanks, either on major or minor structures, where gravity separation of oil from water would be favored as pictured by the foregoing hypothesis.

3. Not only is the structure irregular, but the porosity in the Simpson dolomite is known to be highly irregular. Also, it has been well established that porosity in dolomite is due to solution cavities and not due to shrinking as the result of dolomitization of the original limestone, as had been previously supposed. Therefore, there is no basic reason why porosity in the dolomite should be thought of as being entirely continuous throughout any portion of the reservoir strata.

4. There is good field evidence that neither porosity nor structural conditions display continuity over any great extent. For example, the map clearly indicates the existence of an unproductive strip extending through part of the field from the SE 29-7n-5e to the NW 36-7n-4e.

While structural maps are of very questionable value in this area because most measurements on formation tops were of necessity made in unsurveyed crooked holes, there is much to indicate that reservoir conditions are so irregular that there would have been no possibility of utilizing a well-organized water-drive condition even though the pool ownership had been in the hands of a single company.

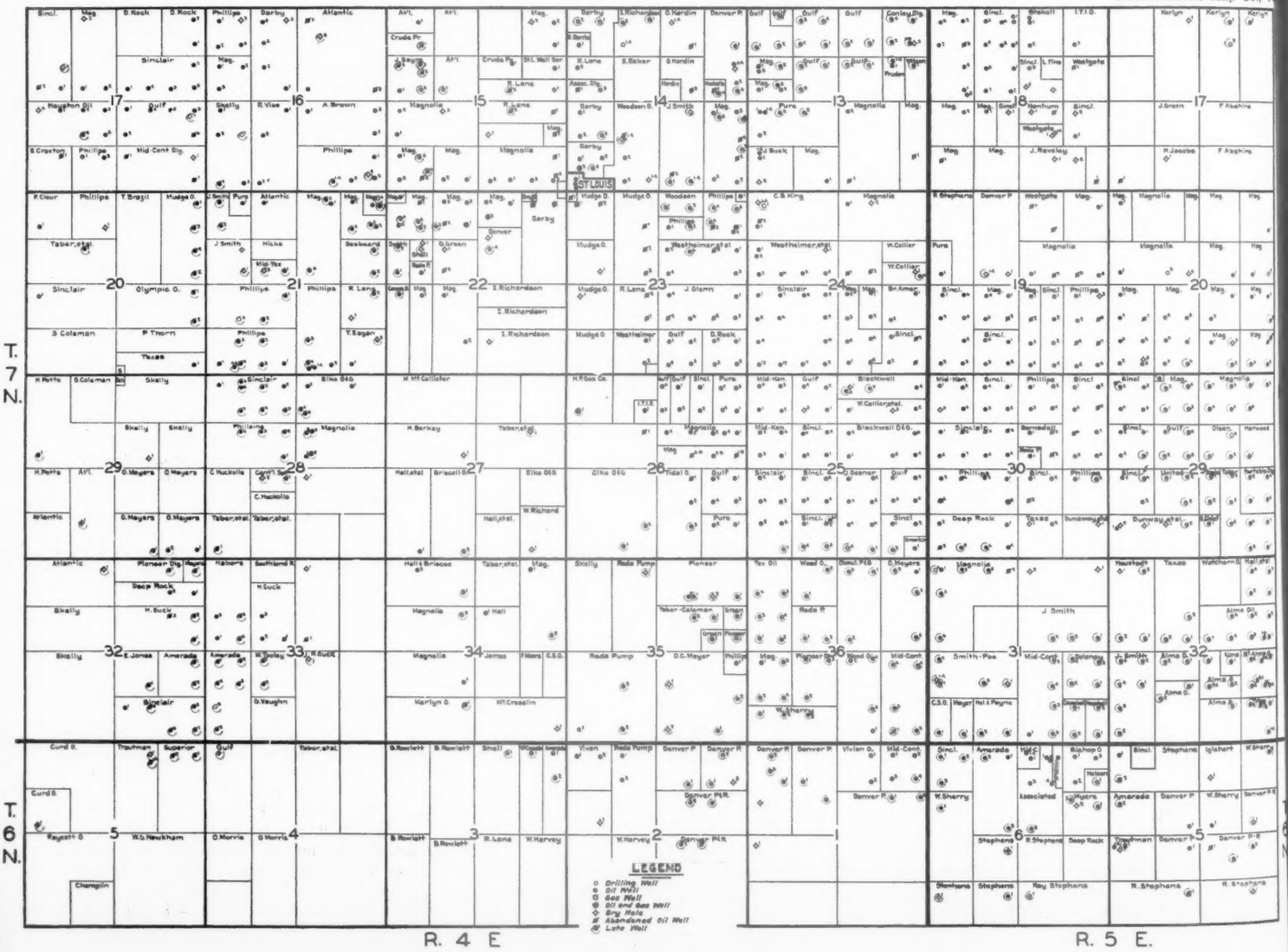
Economics of Large Volume Production

It has been the purpose of this paper to point out the fact that a new production practice has grown up in the St. Louis pool. This practice has made it possible to recover from water-invaded areas millions of barrels of oil which would necessarily have been lost under former production methods. Cost data are beyond the scope of this paper, but proof that the new practice is sound economically is seen in the fact that many new wells have been drilled in water-invaded areas for purpose of applying this recovery procedure.

There is evidence to indicate that this type of secondary recovery could be applied profitably to many of the typical limestone and dolomite reservoirs in their late productive life.

Map showing most of St. Louis pool. Wells drilled since 1933 indicated in green. Most of these were drilled into water for large-capacity pumping

Midcontinent Map Co., T



Naphtha Polyform and Gas Reversion Processes

By J. E. BOGK, P. OSTERGAARD and E. R. SMOLEY
Phillips Petroleum Co. Gulf Oil Corp. The Lummus Co.

THIS paper is concerned with the joint conversion of naphtha and hydrocarbon gases to produce a high yield of motor fuel with A.S.T.M. octane numbers up to 80. This presentation covers only the essentials of the complete paper available in reprint.

The chemistry of gas polymerization is briefly reviewed as an aid in explaining the joint conversion of gas and naphtha. Fig. 1 shows the decomposition rates of propane, butanes and naphtha plotted against temperature obtained experimentally. Fig. 2 shows the ultimate yield of gasoline from propane and butanes cracked at 1,500 and 2,500 lb. pressure plotted against the recycle ratio. It indicates a marked yield improvement as recycle ratio is increased. As generally known, yield depends also on composition of charging stocks, temperature, pressure and reaction time.

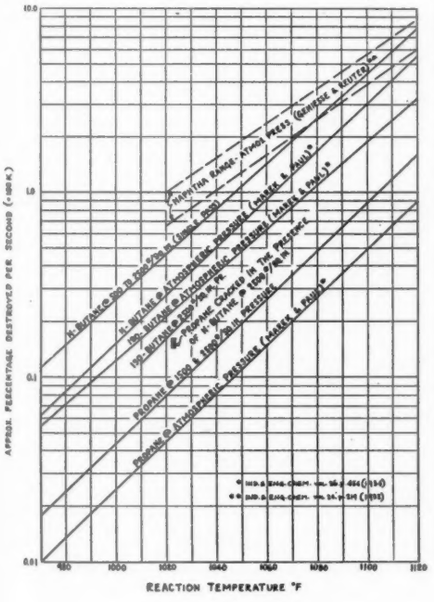
The decomposition rate doubles with an increase in temperature of about 30° F., and is not affected much by pressure. The olefin polymerization reaction velocity is doubled for a temperature increase of approximately 45° F., consequently as temperature is increased, cracking tends to outstrip the polymerization reaction, and the olefin content of the effluent gases from the reaction coil increases. Under favorable conditions of high pressure, moderate temperature and high cycle ratio, a substantial part of the gasoline may be formed through alkylation and other synthesis reactions. Alkylation reactions wherein gaseous olefins react directly with paraffins double their rate with temperature increase of approximately 40° F. Polymerization and alkylation reactions are accelerated by increased pressure.

Cracking velocities of individual propane and butanes as shown in Fig. 1 are increased when admixed with naphtha, due to cooperation and to their partial consumption by alkylation and other synthesis reactions. Admixed gases also have a pronounced physical effect on naphtha reforming which takes place concurrently with gas polymerization. Conversion per pass in thermal reforming of naphthas for production of high-octane gasoline is limited by coke formation. Coke formation is usually ascribed to the condensation of tar on the tube walls in increased amount, and of increasingly higher dew point until coking finally occurs. Admixed gases reduce the partial pressure and the critical temperature, thereby lowering the dew point, which deters tar condensation and deposition. Conversion conditions can be made more severe, with attendant octane-number improvement, when gas-conversion stock is admixed with naphtha in sufficient amount, usually somewhat in excess of volume for volume to produce the physical effects desired.

The joint conversion of naphtha and hydrocarbon

The accompanying article is the discussion of the original paper as presented by Mr. Smoley before the annual meeting of the American Petroleum Institute at Chicago, November 1940.

High yields of motor fuels with C.F.R-A.S.T.M octanes from 70 to 80 are obtained from gas-reversion and polyform operations. Theoretical discussion of improved gas-naphtha conversion results obtained in these processes is presented. Cooperation is obtained with mixed propanes, butanes, and naphtha, and polymerization, alkylation, and other synthesis reactions take place. The dilution of naphtha with gases has a pronounced physical effect on naphtha reforming permitting increased conversion per pass with less tendency towards coke formation. Operating flow sheets and data are presented.



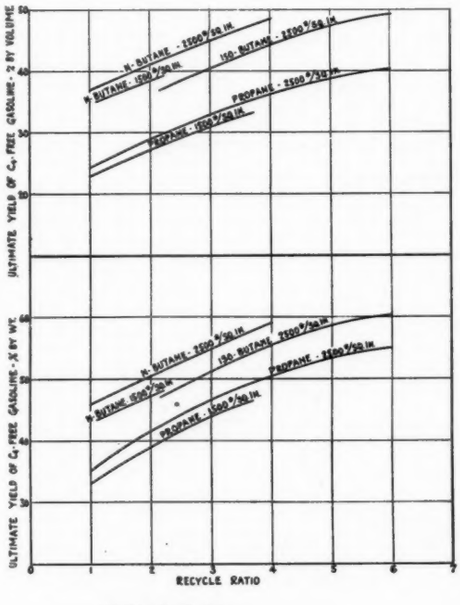
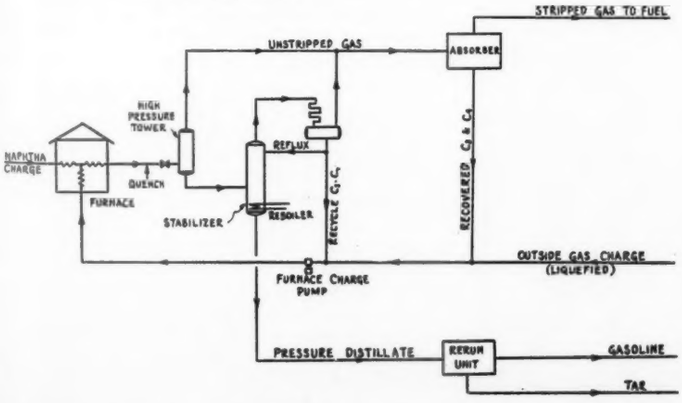
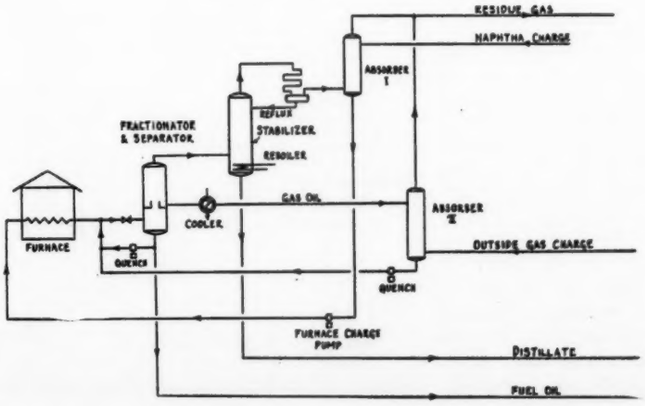
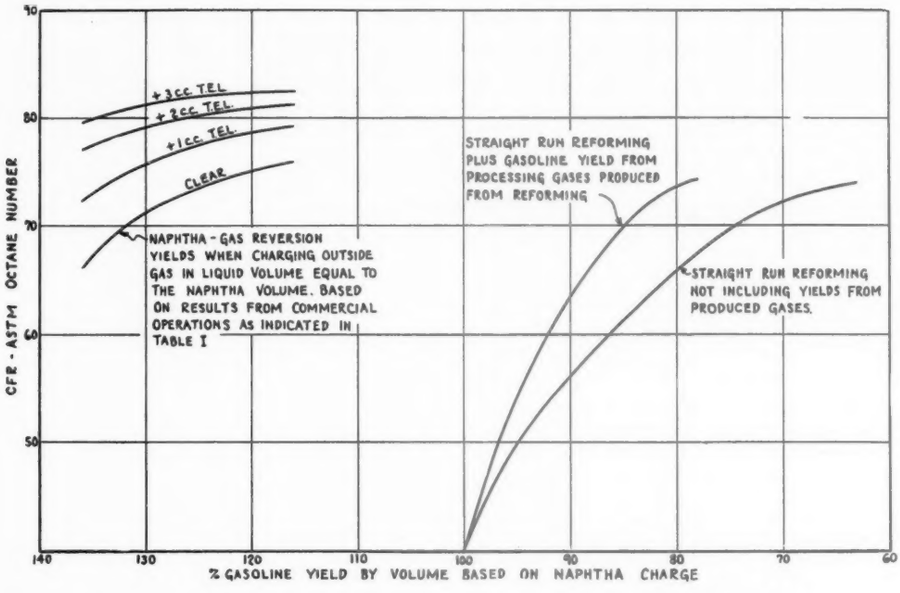


Fig. 1—(Extreme left) Cracking velocity constants of propane, butane and naphtha. Fig. 2—(Left) Effect of recycle ratio on ultimate yields of gasoline from thermal polymerization of propane and butanes (per cent by weight and by volume). Fig. 3—(Left below) Schematic flow of naphtha-gas reversion unit. Fig. 4—(Below) Schematic flow of naphtha polyform unit






+3cc TEL
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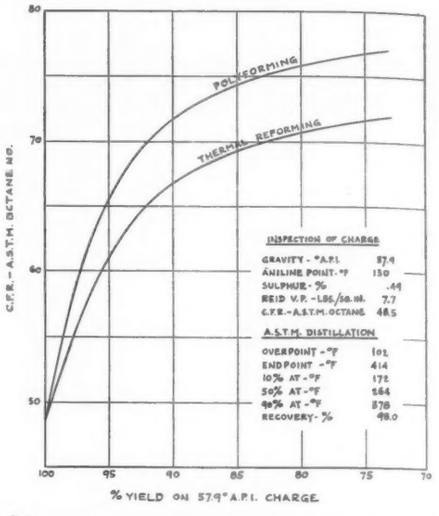
CLEAR
NAPHTHA-GAS REVERSION YIELDS WHEN CHARGING OUTSIDE GAS IN LIQUID VOLUME EQUAL TO THE NAPHTHA VOLUME. BASED ON RESULTS FROM COMMERCIAL OPERATIONS AS INDICATED IN TABLE I
STRAIGHT RUN REFORMING PLUS GASOLINE YIELD FROM PROCESSING GASES PRODUCED FROM REFORMING
STRAIGHT RUN REFORMING NOT INCLUDING YIELDS FROM PRODUCED GASES.
CFR-ASTM OCTANE NUMBER
% GASOLINE YIELD BY VOLUME BASED ON NAPHTHA CHARGE

Fig. 5—(Left) Yield-octane relationships for naphtha-gas reversion and reforming of straightrun gasoline from Gray and Hutchinson counties, Texas, crudes. Fig. 6—(Below) Yield-octane relationship from polyforming and reforming West Texas gasoline


POLYFORMING
THERMAL REFORMING
INSPECTION OF CHARGE
GRAVITY - °A.P.I. 57.9
ANILINE POINT - °F 130
SULPHUR - % .44
REID V.P. - LBS./SQ. IN. 7.7
C.F.R.-A.S.T.M. OCTANE 48.5
A.S.T.M. DISTILLATION
OVERPOINT - °F 101
END POINT - °F 414
10% AT - °F 172
50% AT - °F 264
90% AT - °F 378
RECOVERY - % 98.0
C.F.R. - A.S.T.M. OCTANE NO.
% YIELD ON 57.9° A.P.I. CHARGE

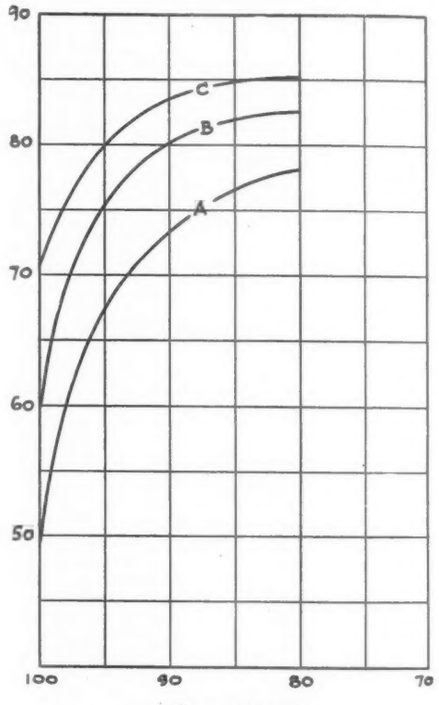


Fig. 7—Yield-octane relationship from polyforming a 15 per cent naphtha cut (from 13.5 to 28.5 per cent) from eastern Venezuela crude

gases into gasoline up to 80 A.S.T.M. octane number is accomplished by the two processes, polyform and gas reversion. The two processes differ in the way the naphtha is introduced into the furnace stream. With the gas-reversion process, the C_3 and C_4 hydrocarbon furnace charge is first subjected to a partial conversion at elevated temperatures before the preheated naphtha is injected into this stream. The final conversion, polymerization and other side reactions of and between the gaseous hydrocarbons and the naphtha take place in a common soaking section at somewhat reduced temperatures. With the naphtha polyform process a mixture of naphtha and C_3 and C_4 hydrocarbons is passed together through the entire heater coil, and all of the reactions progress concurrently.

The choice between polyforming and gas reversion depends primarily on the relative quantities of gas and naphtha charge available, and on the relative importance of yield and octane number desired. In general polyforming presents a favorable picture with high ratio of naphtha to gas charge and the production of high-octane-level motor fuel. The gas-reversion process is usually applied with high ratio of gas to naphtha and the production of moderately high octane-number gasoline. Various modifications and combinations of the foregoing have been adopted commercially for the optimum yield-octane results desired.

The gas-reversion process as shown in Fig. 3 combines a virgin and recycle liquefied gas which are first preheated and then passed through the gas-conversion portion of the coil where time-temperature conditions are varied in accordance with the composition of the stock. The preheated naphtha is injected into the gaseous stream at the optimum point, and the mixture then passes through the remainder of the coil, where proper conditions are maintained to effect further gas-conversion reactions simultaneously with conversion of the naphtha. The stabilizer bottoms are separated into gasoline, quench oil and fuel oil by a rerun operation; and the recycle gas is recovered by absorption.

The polyform process as shown in Fig. 4 utilizes the naphtha charge as an absorption oil to absorb the uncondensed C_3 and C_4 recycle from the residue gas leaving the stabilizer condenser. The liquefied C_3 and C_4 recycle stock from the stabilizer condenser is mixed with the rich naphtha in the base of the absorber. The rich naphtha is preheated and then charged through the furnace. The effluent from the furnace is quenched with fractionator bottoms, flashed to remove tar and then fractionated and stabilized to end-point gasoline.

Operating conditions will vary according to the type of operation. The naphtha-gas reversion process would normally operate from 1,020°-1,120° F. in the gas-conversion section, and 960°-1,060° F. in the reversion section. Outlet pressure on the coil will vary from 1,500-2,000 lb. per sq. in. The naphtha polyform process operates between 1,025°

TABLE 1—Commercial Operating Data of Naphtha-Gas Reversion Units

	Run No. 1	Run No. 2	Run No. 3	Run No. 4	Run No. 5
Charge:					
Naphtha, per cent	100.0	100.0	100.0	100.0	100.0
Outside-gas feed, per cent on naphtha	100.0	100.0	100.0	100.0	100.0
Total charge, per cent on naphtha	200.0	200.0	200.0	200.0	200.0
Yield of Gasoline of 8.5 PSI Reid Vapor Pressure (based on naphtha charge), per cent	135	131	134	128	119.5
Gravity, deg API	61.3	59.5	62.0	61.5	59.8
ASTM Distillation, in Deg F:					
Initial boiling point	95	95	93	98	98
10-per-cent point	125	143	123	132	137
50-per-cent point	204	224	210	204	203
90-per-cent point	353	347	345	339	321
End point	402	410	406	408	405
Sulfur (lamp), per cent	0.06	0.02	0.09	0.10	0.09
CFR-ASTM Octane No., at 6.5 psi Reid vapor pressure:					
Clear	69.2	67.3	69.0	73.0	75.5
Plus 1 ml per gal TEL	74.2	73.6	74.0	77.1	79.1
Plus 2 ml per gal TEL	78.6	78.0	78.0	79.8	81.2
Plus 3 ml per gal TEL	80.5	80.6	80.5	81.0	82.6
Fuel-Oil Yields:					
Per cent on naphtha.. ....Average 3 per cent	....	....	....	....	....
Gravity, deg API..... 12.0	...	....	....	....	....
Saybolt Furol viscosity at 122 deg F.... 90.0	....	....	....	....	....
Water and sediment, per cent..... 0.2	....	....	...	....	....
Naphtha Charge:					
Gravity, deg API	60.6	61.6	60.1	59.6	58.7
ASTM Distillation, in Deg F:					
Initial boiling point	110	99	110	105	104
10-per-cent point	156	150	160	157	162
50-per-cent point	244	242	250	255	261
90-per-cent point	364	366	375	400	410
End point	424	423	428	446	450
Evaporated at 212 deg F, per cent	....	34	....	31	....
Aniline point, deg F	133.2	132.8	133.9	136.2	134.2
Sulfur (lamp), per cent	....	....	....	0.12	0.11
CFR-ASTM octane No.	49.0	46.4	47.8	...	49.4
Outside-Gas Feed:					
Analysis, liquid-volume per cent:					
Hydrogen	....	....	....	....	....
Methane	2.7	0.6	2.8	2.8	2.6
Ethane	9.7	2.9	11.0	23.9	13.9
Ethene	0.7	0.2	1.0	1.5	0.5
Propane	44.9	12.5	52.3	54.4	38.6
Propene	5.5	2.7	4.7	15.2	5.9
Butanes	32.2	74.3	26.0	2.2	35.5
Butenes	3.9	6.6	2.0	....	2.9
Pentanes	0.4	0.2	0.2	....	0.1
Total unsaturates, liquid-volume per cent	10.1	9.5	7.7	16.7	9.3
Sulfur (lamp), per cent	....	...	...	0.83	0.44

and 1,125° and 1,000 and 2,000 lb. per sq. in. outlet pressure. The equipment for and the operation of these units is similar to conventional cracking units with which the average refiner is familiar.

The following results and data for these processes were obtained from commercial units. Table 1 shows yields, octanes, lead susceptibility and inspection of charge and products from five different runs processing Gray and Hutchinson counties, Texas, naphtha with equal volumes of liquefied gas by the gas-reversion process. Gasoline yields of 120 to 135 per cent on naphtha charge with clear A.S.T.M. octane numbers up to 76 were obtained as shown in Fig. 5 (author's Fig. 8 in reprint). These yield-octane and lead-susceptibility data are plotted in the upper left corner of Fig. 5. For comparison, the yield-octane relationship for conventional thermal reforming and for reforming plus thermal polymerization of gases produced from reforming, are shown on the right.

Table 2 shows yields, octanes, lead susceptibility and inspections of charge and products for polyforming various naphthas. Column 3 (Operation 3) shows the results for polyforming eastern Venezuela naphtha with its own gases, and Columns 5 and 6 (Operations 5 and 6) Mid-Continent naphthas with outside gas. Operation 3 with no outside gas shows 87 per cent of 76 A.S.T.M. octane, while in Operations 5 and 6 with outside gases 99 and 120 per cent of 75 and 77 A.S.T.M. octane were obtained. Fig. 7 (Fig. 10 in reprint) shows the yield-A.S.T.M. octane and lead-susceptibility relationship for polyforming the above eastern Venezuela naphtha under varying conditions. The spread between the A.S.T.M. and research octane numbers of an ordinary thermal-cracked gasoline is of the order of 5 to 9, while for polyformed gasoline it is 9 to 14.

Yield-octane relationships from polyforming and reforming West Texas straightrun gasoline with its own gas are given in Fig. 6 (Fig. 9 in reprint). The large gains in both yield and octane number which are obtained by the polyform operation are illustrated in this figure.

Fig. 8 (Fig. 11 in reprint) shows a comparison of octane number and tetraethyl lead susceptibility between thermal reformed and naphtha polyformed gasoline from a 50-50 mixture of Mid-Continent and Pennsylvania naphthas. Polyformed gasoline has a more favorable lead susceptibility

TABLE 2 — Yields, Products, and Operating Data of Naphtha Polyform Units With and Without Outside Gas

Operation No.:	(1) Polyforming Naphtha—5 Per Cent (23.5 to 28.5 Per Cent on Eastern Venezuelan Crude)			(2) Polyforming Naphtha—10 Per Cent (18.6 to 28.5 Per Cent on Eastern Venezuelan Crude)			(3) Polyforming Naphtha—15 Per Cent (13.4 to 28.5 Per Cent on Eastern Venezuelan Crude)			(4) Polyforming Naphtha—10 Per Cent (18.6 to 28.5 Per Cent on Eastern Venezuelan Crude)			(5) Polyforming Naphtha with Outside-Gas Feed (Mid Continent Naphtha 20 to 32 Per Cent on Crude)			(6) Polyforming Naphtha with Outside-Gas Feed (Mid Continent Naphtha 26 to 34 Per Cent on Crude)		
OPERATING DATA:	Barrels Per Day	Per Cent by Volume	Per Cent by Weight	Barrels Per Day	Per Cent by Volume	Per Cent by Weight	Barrels Per Day	Per Cent by Volume	Per Cent by Weight	Barrels Per Day	Per Cent by Volume	Per Cent by Weight	Barrels Per Day	Per Cent by Volume	Per Cent by Weight	Barrels Per Day	Per Cent by Volume	Per Cent by Weight
Charge:																		
Naphtha	4,000	100	100	4,000	100	100	4,000	100	100	4,000	100	100	2,515	100	100	1,111	100	100
Outside gas (fuel-oil equivalent)	....	....	....	....	....	....	....	....	....	....	....	....	2,286	90.9	96.9	1,894	170.5	188.9
Total	4,000	100	100	4,000	100	100	4,000	100	100	4,000	100	100	4,801	190.9	196.9	3,005	270.5	288.9
Yields:																		
Gasoline	3,040	76.0	74.3	3,350	83.9	82.0	3,470	86.8	85.5	2,580	64.6	64.4	2,480	98.6	94.98	1,337	120.3	113.7
Gas (fuel-oil equivalent)	467	11.7	11.7	360	9.0	9.4	336	8.4	9.0	709	17.7	19.5	2,118	84.22	88.43	1,565	140.9	156.9
Tar	446	11.3	14.0	296	7.4	8.6	180	4.5	5.5	540	13.5	16.1	198	7.89	10.27	83	7.5	9.9
Total	3,953	99.0	100.0	4,006	100.3	100.0	3,986	99.7	100.0	3,829	95.8	100.0	4,796	190.71	193.68	2,985	268.7	280.5
Temperatures, deg F:																		
Charge to furnace	....	475	....	....	475	....	....	475	....	....	425	....	....	425	....	....	360	....
Products from furnace	....	1,000	....	....	1,080	....	....	1,085	....	....	1,125	....	....	1,075	....	....	1,040	....
Pressures, psi:																		
Charge to furnace	....	1,250	....	....	1,250	....	....	1,250	....	....	1,250	....	....	1,250	....	....	1,550	....
Products from furnace	....	1,000	....	....	1,000	....	....	1,000	....	....	1,000	....	....	1,000	....	....	950	....
Fractionating system	....	300-350	....	....	370-400	....	....	300-350	....	....	300-350	....	....	350	....	....	290-370	....
Quantities:																		
Rich-naphtha circulation, bbl per day	....	9,220	....	....	9,000	....	....	9,030	....	....	12,100	....	....	12,100	....	....	6,660	....
Gaseous charge, MCF per day	....	....	....	....	....	....	....	....	....	....	....	....	....	7,480	....	....	6,310	....
Residue gas, MCF per day	....	2,620	....	....	2,025	....	....	1,910	....	....	4,220	....	....	8,420	....	....	6,440	....
LABORATORY INSPECTION:	Charge	Distillate	Tar	Charge	Distillate	Tar	Charge	Distillate	Tar	Charge	Distillate	Tar	Charge	Distillate	Tar	Charge	Distillate	Tar
Gravity, deg API	45.7	50.0	16.1	47.9	52.0	22.9	50.8	53.9	17.4	47.9	48.5	18.8	51.8	58.8	9.5	51.3	61.9	8.7
ASTM Distillation, in Deg F:																		
Initial boiling point	318	92	355	266	100	375	230	96	348	266	98	352	160	91	....	158	91	....
10-per-cent point	329	146	386	290	152	419	258	140	393	290	152	408	236	126	....	255	106	....
50-per-cent point	349	298	500	311	282	510	286	250	511	311	270	518	324	228	....	325	196	....
90-per-cent point	409	372	....	372	349	....	358	335	....	372	336	....	407	366	....	380	330	....
End point	465	412	....	431	404	....	412	400	....	431	406	....	446	409	....	426	378	....
Reid vapor pressure, psi	....	9.1	....	....	8.2	....	....	10.0	....	....	7.5	....	....	....	....	1.7	10.2	....
Color, Saybolt	....	+1	....	....	+1	....	....	+14	....	....	+2	....	+18	+30	....	+26	+30	....
ASTM gum, mg per 100 ml	....	5	....	....	7.4	....	....	6.0	....	....	....	....	....	1	....	....	5	....
Copper-dish gum, mg per 100 ml	....	85	....	....	55	....	....	12	....	....	....	....	....	10	....	....	79	....
Oxygen stability (EGC *) at 210 deg F, min.	....	190	....	....	180	....	....	165	....	....	155	....	....	45	....	....	30	....
Acid heat, deg F	2	96	....	2	89	....	2	92	....	....	101	....	2	95	....	3	115	....
Aniline point, deg F	126	65	....	136	71	....	116	71	....	....	39	....	136	96	....	130	85	....
Viscosity (Saybolt Universal), sec:																		
At 100 deg F	....	....	49	....	....	41	....	....	48	....	....	47	....	....	1,044	....	....	447
Conradson carbon residue, per cent	....	....	7.4	....	....	3.3	....	....	6.5	....	....	8.1	....	....	5.9	....	....	12.78
Water and sediment, per cent	....	....	0.2	....	....	0.2	....	....	0.2	....	....	0.6	....	....	0.2	....	....	0.25
Pour point, deg F	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Flash point (Pensky-Martens), deg F	....	....	140	....	....	164	....	....	152	....	....	160	....	....	....	....	....	....
ASTM octane No.:																		
Clear	40.9	76.6	....	47.3	76.1	....	49.7	76.1	....	47.3	80.1	....	39	75.2	....	36.9	76.7	....
Plus 1 ml per gal TEL	50.0	81.3	....	56.9	82.0	....	59.6	82.7	....	56.9	83.7	....	....	80.8	....	....	80.7	....
Plus 3 ml per gal TEL	60.6	83.8	....	66.1	84.4	....	70.5	85.1	....	66.1	85.6	....	....	83.4	....	....	83.5	....
Research octane No.:																		
Clear	46.0	88.7	....	50.1	86.4	....	51.5	85.5	....	50.1	92.7	....	....	88.0	....	....	88.2	....
Plus 1 ml per gal TEL	49.8	93.7	....	58.3	91.2	....	60.1	92.2	....	58.3	96.4	....	....	92.1	....	....	92.0	....
Plus 3 ml per gal TEL	62.5	95.6	....	70.0	94.8	....	71.3	94.8	....	70.0	98.0	....	....	94.7	....	....	95.0	....
	Feed	Residue		Feed	Residue		Feed	Residue		Feed	Residue		Feed	Residue		Feed	Residue	
Gas Analysis:																		
Specific gravity (air = 1)	....	0.708		....	0.782		....	0.690		....	0.671		1.11	0.918		1.18	0.959	
Composition, per cent by volume:																		
Hydrogen and methane	....	63.6		....	60.9		....	65.4		....	68.4		36.5	46.7		30.2	41.5	
Ethene	....	8.1		....	8.9		....	8.3		....	6.8		2.8	5.4		3.0	3.7	
Ethane	....	26.4		....	27.8		....	24.3		....	23.0		13.6	23.8		18.6	25.8	
Propene	....	....		....	1.0		....	0.4		....	....		8.7	5.8		10.2	7.2	
Propane	....	1.9		....	3.4		....	1.6		....	1.8		24.0	15.4		10.4	16.2	
Butenes	....	....		....	....		....	....		....	....		4.8	....		6.7	1.9	
Butanes	....	....		....	....		....	....		....	....		7.5	2.9		8.3	3.6	
Pentanes	....	....		....	....		....	....		....	....		1.7	....		3.6	....	
Hexanes	....	....		....	....		....	....		....	....		0.4	....		....	....	
Unsaturates	....	8.1		....	9.9		....	8.7		....	6.8		....	....		....	....	
Total	....	....		....	....		....	....		....	....		100	100		100	100	

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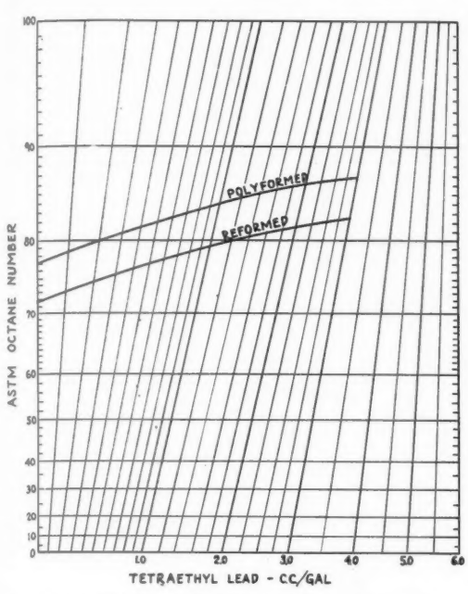
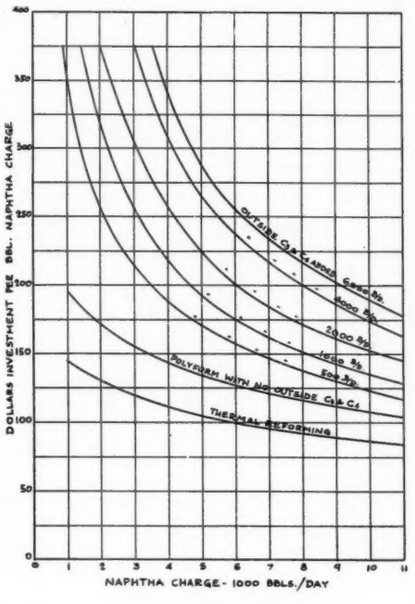
than reformed gasoline, since the increase in octane with equal additions of tetraethyl lead is about the same at a 5-octane-number higher level.

The high octane number, blending value and general characteristics of gasoline from thermal polymerization of propanes and butanes are well known. Naphtha polyform gasolines have octane numbers of the same order as thermal polymer, and there is little difference in the general characteristics and lead susceptibility of these two stocks. In general, the entire gasoline production





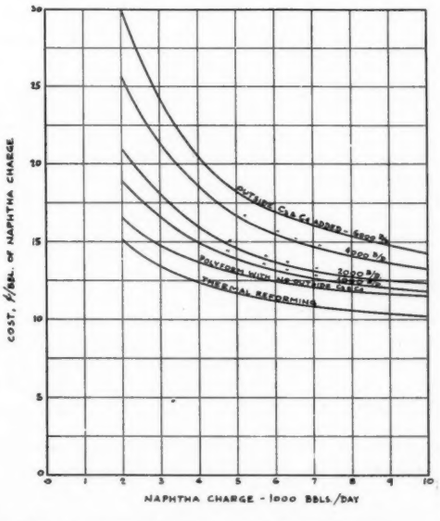

COST, $/BBL. OF NAPHTHA CHARGE
NAPHTHA CHARGE - 1000 BBLS./DAY
OUTSIDE C3 & C4 ADDED - 6000 BBL.
4000 BBL.
2000 BBL.
1000 BBL.
POLYFORM WITH NO OUTSIDE C3 OR C4
THERMAL REFORMING

Fig. 8—(Above) Comparison of octane numbers and TEL susceptibility between thermal reformed gasoline and polyformed gasoline from a 50/50 mixture of Mid-Continent and Pennsylvania for same yield. Fig. 9—(Right, above) Unit investment costs of naphtha polyform and gas-reversion units. Fig. 10—(Right) Direct operating costs of naphtha polyform and gas-reversion units

from a naphtha polyform unit is of a quality comparable to thermal polymer blending stock.

The treating characteristics of distillates from these operations are similar to those of thermal cracked distillates. They may be clay-treated in conventional manner to 30-plus-color gasoline; the clay treatment usually results in an increase in A.S.T.M. octane number of about one-half, a decrease in acid heat, and an increase in inhibitor response, inhibitor requirements being reduced approximately 25-50 per cent depending upon type of inhibitor used. High-octane polyform distillates can be acid-treated to improve acid heat, oxygen and color stability, lead susceptibility, and gum and sulfur content. These distillates may be readily sweetened by conventional methods.

Gas reversion has been in full-scale operation in the Phillips Petroleum Co. refineries for several years, and six units are in regular operation, representing a total charging capacity of 26,000 bbl. per day, consisting of half liquefied gas and half naphtha. These units operate on approximately 2,000-hour cycles.

The naphtha-polyform process has been in commercial operation for over 4 years in the various refineries of the Gulf Oil Corp. In four installations, a total charge of 12,000 bbl. per day of naphtha, propanes, and butanes are processed. These units operate 2,000 to 2,500 hours between cleanouts. At present the Lummus Co. has under construction a 4,000-bbl. per day unit for the Gulf Oil Corp., and a unit for a Gulf Coast refiner. This latter unit is designed to charge 9,000 bbl. per day of naphtha and 4,000 bbl. per day of outside propanes and butanes. The total charging capacity of naphtha-gas conversion units, operating and under construction, amounts to 55,000 bbl. per day.

The commercial application of any new process regardless of improved results obtained must be justified on an economic basis.

The polyform and gas-reversion processes offer the refiner an extremely flexible method for adjusting the yield-octane relationship and gasoline quality to meet changing requirements. The upper octane limit may be substantially raised and the road performance materially improved.

The naphtha polyform and gas-reversion processes offer improvements in yield and quality of products over existing methods of processing the same charge stocks, particularly when the economics of these processes is considered.

Fig. 9 (Fig. 14 in reprint) shows investment costs for units of varying naphtha-gas charge capacities, based on a gas feed containing approximately equal liquid volumes of propanes and butanes.

Material specifications are based on processing noncorrosive stocks, and construction costs are based on labor rates prevailing in the Mid-Continent area. For an example, a plant processing 4,000 bbl. per day of naphtha and 2,000 bbl. per day of outside propanes and butanes will cost erected $257 per barrel of naphtha, charged, or $1,028,000.

Fig. 10 (Fig. 15 in reprint) shows direct operating costs for varying naphtha-gas charge capacities. The unit utility costs used are given in the paper. Average maintenance, cleaning, and inspection costs obtained from commercial operations are included in the direct operating costs plotted. For the same plant processing 4,000 bbl. per day of naphtha and 2,000 bbl. per day of outside propanes and butanes, the direct operating cost will be 16 cents per barrel of naphtha charged, or $640 per day.

Current realizations of recently erected commercial naphtha-gas reversion and naphtha polyform units show a payout period on the investment for these processes, of from 1 to 2 years, due to increased gasoline yield and saving in tetraethyl lead. This economic picture, plus the fact that these operations are carried out in a single unit, makes these processes attractive to the refining industry for the production of high yields of higher-octane-level motor fuels.

In the discussion that followed presentation of this paper, Dr. Egloff, of Universal Oil Products Co., asked questions regarding catalytic polymerization and alkylation of olefins in conjunction with polyform and comparison of polyform with catalytic reforming. In reply, Dr. Smoley pointed out that olefins in the outside feed gas can be catalytically polymerized or alkylated with the effluent gases forming satisfactory feed to the polyform and gas-reversion processes. The economics favors the polyform and gas-reversion processes over the catalytic reforming because of substantially lower investment and operating costs.

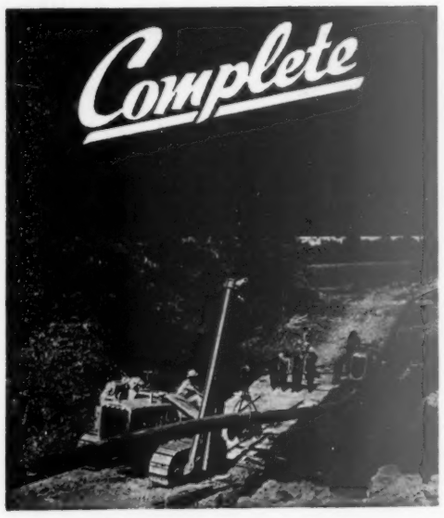
H. W. Field, of Atlantic Refining Co., asked questions concerning comparison of polyforming and thermal reforming yields, conversion per pass in polyforming, investment cost comparison with thermal reforming and utilities consumption. In reply it was pointed out that polyforming and gas-reversion yields and octanes are elevated above those obtained from thermal reforming plus polymerization of the gases obtained from reforming due to synthesis reactions and other effects. It was pointed out that under average conditions of operation, the disappearance per pass of combined propanes and butanes is in the order of 18 per cent and that higher conversion rates are possible without coking formation difficulties. The investment cost of polyform and gas-reversion units is smaller than throughputs would indicate due to different pressure and temperature conditions in polyform and gas-reversion units. With higher temperature levels and larger amount of heat exchange available, it was pointed out that water consumption for polyform plants follows heater duty and is only slightly greater than for ordinary thermal reforming and transfer-line exchangers are sometimes used.

Questions and Answers

Are there any companies which have a drilling-time service? What are some good papers on this subject?—E. D. G., Jackson, Miss.

There are no companies which have drilling-time service, but the instruments for performing this work are being sold to the contractor or operator. The main work involved is the charting of the information obtained from the record.

You may be interested in reading the two articles which appeared in The Oil and Gas Journal in 1939, "Drilling-Time Data in Rotary Practice," by T. C. Hiestand, July 13, Page 55, and "Drilling-Time Data in Rotary Practice," by P. B. Nichols, July 20, Page 40; also the paper by C. A. Yeatman, "Practical Utilization of Rate-of-Penetration Drilling Data."



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Pipe-Line Activity

Kaw Pipe Line Awards Contract to Fredell

Kaw Pipe Line Co. has recently awarded a contract to Fredell Construction Co., Houston, for the laying of 22 miles of 8-in. crude-oil pipe line to connect the Bemis pool of Kansas with the company's system. The line will run northwest from the company's Sullivan station in Section 14-14-15, Russell County, Kansas, to a point south of the Saline River, Section 11-11-17, Ellis County. Work will get under way on December 18 and will be completed January 15, 1941.

Dempsey-Wilson Nears Completion Of Geneseo-Belvidere Gas Line

Dempsey-Wilson Construction Co. has completed 90 miles of the 100-mile 20-in. section of the project of Natural Gas Pipeline Co. of America which was undertaken for the purpose of connecting the company's system with Milwaukee markets. The remaining 10 miles will be completed by the end of the month.

The section contracted by Dempsey-Wilson is between the Geneseo, Ill., compressor station and Belvidere, Ill. I. C. Little has 24 miles of pipe on this project from Belvidere to the Illinois-Wisconsin state line; his operations have been stopped in Wisconsin because the necessary permits have not been issued by state authorities.

Williams Brothers Lays Line For Standard at Baton Rouge

Williams Brothers Corp. is laying 7½ miles of 10-in. for Standard Oil Co. of Louisiana at Baton Rouge, La., in connection with the system serving the company's refinery. Work has been completed on the 54-mile 8-in. pipe line laid by this contractor for Magnolia Pipe Line Co. between the Duggan-Slaughter field, Hockley County, Texas, and Seminole, Tex. Construction of about 30 miles of 8-in. gathering lines to several fields in the area is now under way.

The work of this contractor in the construction of a 200-mile line from East Texas to the Gulf Coast for Pan-American Pipe Line Co. has been impeded by flood conditions which have interfered with operations of two spreads.

Supreme Court May Decide Pipe-Line Suits Before July

WASHINGTON, D. C., Dec. 17.—Possibility exists that pipe-line suits alleging violation of the Elkins Anti-rebate Act may reach a final decision in the Supreme Court before the summer recess next June. The probability of a decision by midyear is not as bright as the possibility. The Department of Justice has obtained an expediting order permitting trial before a statutory court of three judges from which appeal may be taken direct to the Supreme Court. Pending at the present is a plea for change of venue entered December 6 at Philadelphia by Great Lakes Pipe Line Co. and Phillips Pipe Line Co. Suits against the two corporations were filed in Wilmington, Del., and the companies are pleading for trial of the cases in locale where alleged violations are claimed to have occurred, the Mid-Continent or Middle West.

Stanolind Pipe Line Co., the third defendant in the Department of Justice suits filed September 30, has been granted until January 5 to file its answer at Hammond, Ind., where the complaint against it was filed. The Department of Justice has made no commitment as to its future plans with respect to pipe lines but the suits pending against the three defendants already specified in complaints are admitted to have important significance for the entire pipe-line system of the country. The Department of Justice has calculated that 50 companies are directly or indirectly involved in the outcome of the three cases.

B. & M. Lays Line for Pure at Cumberland

Construction of a 16-mile 6-in. pipe line to connect Pure Oil Co.'s tank farm in the Cumberland field of southern Oklahoma with the Texas Pipe Line Co.'s pump station at Armstrong, just north of Durant, will be started soon. B. & M. Construction Co. of Oklahoma City, Okla., has the contract and work is to start immediately. The two-county field, on the Oklahoma side of the Denison Dam basin, now has 13 producers.

United Gas Increases Pipe-Line Facilities

SHREVEPORT, La.—United Gas Pipe Line Co. laid 6½ miles of 10-in. and 1½ miles of 6-in. to connect the gas reserves of the Joaquin-Logansport area with the Latex-Beaumont 16-in. main line, 3 miles east of Joaquin, Tex., according to United Gas Log. In addition to being the main outlet for the gas reserves of the Joaquin-Logansport field, the line provides a new supply of gas which will be a great aid in maintaining an even pressure on the main transmission line during the winter season.

At the main line tie-in a new 16-in. block gate is being installed with a 6-in. connection toward Magasco and an 8-in. connection toward Latex. Tie-ins at the main line were made so that gas may either be transmitted directly to Latex or Magasco or to both ends of the line at the same time. In case of a break

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Pipe-Line Personalities . . . . . W. H. Buckley

W. H. BUCKLEY

W. H. BUCKLEY, superintendent of the gas pipe-line division of the Arkansas Louisiana Gas Co., rounded out his thirtieth year in the gas industry in August of 1940.

After graduation from Mississippi A. & M. College in 1911, Mr. Buckley became connected with the Arkansas Natural Gas Corp. and worked on the construction of one of its compressor stations until the summer of 1912, when he was made an oiler. A year later found him as second engineer and, in 1915, he was promoted to first engineer. One year later he was made plant superintendent in charge of company compressor stations and plant construction.

In the spring of 1926, Mr. Buckley was selected to be assistant to the general superintendent and a year later, after directing the building of another company compressor station, was made general superintendent of the Arkansas Natural Gas Corp. He held that position until 1929, when he assumed the position he now holds as superintendent of the gas pipe-line division of Arkansas Louisiana Gas Co., an affiliate of Arkansas Natural Gas Corp.

Widely known for his genial disposition and his knowledge of the gas industry as a whole, Mr. Buckley is one of the most popular members of the Shreveport Rotary Club, and takes an active part in the affairs of El Karubah Shrine Temple in Shreveport. He is found ready and willing to assist in any worthy civic undertaking. Mr. Buckley is married, has lived in Shreveport since 1927. His principal hobbies are horses and boats.

on the main transmission line this block gate can be closed and delivery of gas from the new line maintained into the section of main line where there is no service interruption. As an added precaution, check valves are installed on the new connections to the main line.

United Gas Pipe Line Co. has also laid 11.53 miles of 4-in. at Archer City, Tex., which connects with the Olney-Graham 8-in. line.

In line with the building programs in progress at government air fields, the San Antonio section crew of United Gas Pipe Line Co., under the supervision of Fred Hinton, has recently completed the rearrangement of lines and measuring stations serving Kelly and Duncan fields and Camp Normoyle, San Antonio.

The company has installed standard gas heaters at several points on lines serving Jackson, Miss., where pressure is reduced from 400 lb. to 35 lb. pressure. Last winter some trouble was incurred as a result of the freezing of hydrates in the lines. The heaters are placed more than 20 ft. from measuring stations as a safety provision. During cold weather the block valve on the inlet line is closed and the gas is heated by a thermostatically controlled flame before it passes on to the meter and regulator.

State Permits Required for Wisconsin Natural-Gas Lines

MADISON, Wis.—The Wisconsin Public Service Commission has ruled that utility companies in Wisconsin which propose to substitute natural gas for manufactured must first obtain certificates of public convenience and necessity from the state commission. This ruling is in line with the federal law which requires that similar certificates be obtained from the Federal Power Commission before the installation of interstate transmission lines for natural gas into any state.

Michigan Pipe-Line Project Will Cost $500,000

SAGINAW, Mich.—Application has been filed with the Public Service Commission in Michigan by Consumers Power Co. for permission to construct and operate 60 miles of 12-in. natural-gas line from the Missaukee, Osceola and Clare County fields. Hearings on the application are scheduled December 20.

The line will connect near Midland to Consumer's 8-in. main line from the Six Lakes field to Saginaw and Bay City. Cost of the project proposed by the company is estimated at $500,000. The first 21 miles of the new system is now under construction extending from the main trunk line to the Wise pool, under authority previously approved. The remaining 39 miles would not be built until next spring.

Natural-gas reserve tentatively estimated at more than 20,000,000 M.c.f. and covering 7,000 acres of semi-developed properties are claimed in Clare, Osceola and Missaukee counties. The proposed line would make the tricounty reserves available for the Saginaw Valley market. There are no lines now serving the fields.

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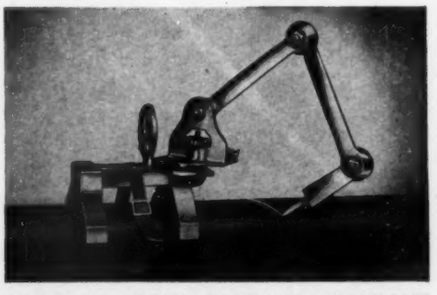

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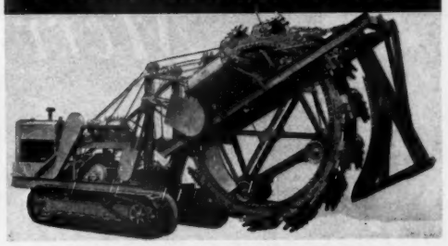

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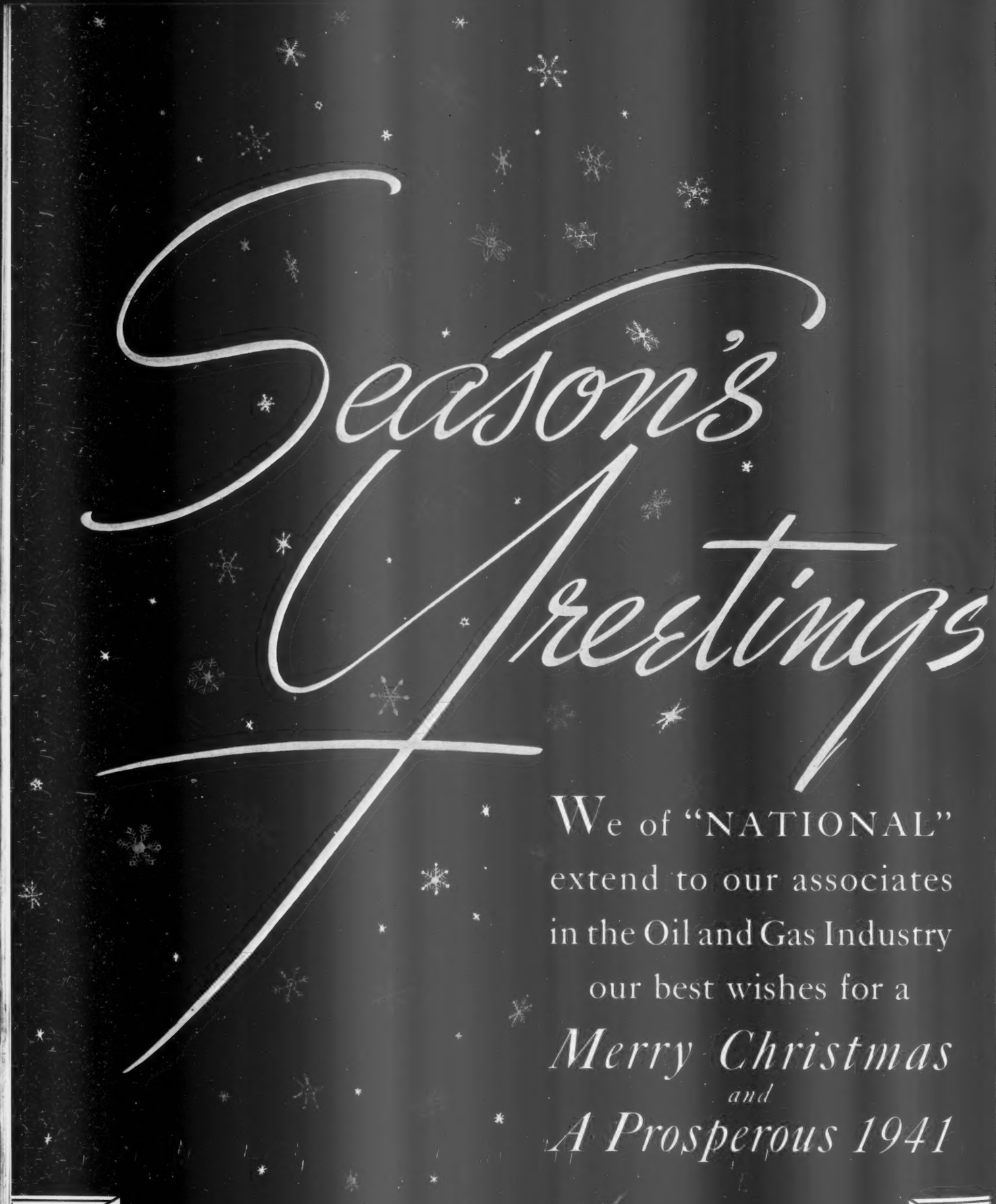

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FIELD DEVELOPMENTS...

HIGHLIGHTS FROM THE WEEK'S NEWS—

Completions showed a small increase over those of the preceding 3 weeks, being 529 as compared with an average of 507. Dry holes increased 31 to 144. Of the 31 increase, Illinois was responsible for 14. This increase is not considered significant, however, as many of the abandoned wildcats in Illinois had been shut down for some time and were only reported officially abandoned during the past week.

Although none of the week's developments were in themselves particularly important, they point the way to next year's activity to a greater extent than do the results of many recent weeks' activity. The most important news was in the widespread favorable showings to the west and southwest of the Barton arch production in Kansas, and the increasing importance of the Wilcox trend play from northern Louisiana to the Laredo district.

KANSAS: The discovery of oil in a Permian lime in Thomas County, 42 miles west of the nearest wildcat discovery and 60 miles west of the Morel pool may greatly stimulate activity in that region. Shallow Water has been extended a mile to the northeast and a new Viola pool has been found 1 mile south of the Cunningham gas field in Kansas. A Gorham sand discovery in southeastern Russell County added to a week of highly significant development (p. 60).

LA-ARK: The deep tests in the Athens and Lisbon fields continue to test favorable showings in deep sands which now produce in Cotton Valley. The Wilcox sand play is extending throughout Caldwell, Catahoula and La Salle parishes (p. 63).

EAST TEXAS: Following the successful completion of the Woodbine sand discovery near Hawkins, Wood County, 11 tests are planned in addition to the 3 reported last week. Woodbine tests are also announced for Rains County and for the Whitehouse community of Smith County (p. 80).

NORTH TEXAS: The third Palo Pinto lime discovery in Baylor County is indicated about 2½ miles north of the Seymour field (p. 56).

TEXAS GULF: The Wilcox trend play received added impetus as a wildcat in Lavaca County logged favorable showings. If successful, this would be the third Wilcox discovery in the Upper Gulf Coast district for the year. The Red Fish Reef discovery in Galveston Bay assumes greater importance as Humble's test 1 mile south of the discovery logged good showings. A second oil sand was found in the LaBelle field (p. 70).

WEST CENTRAL TEXAS: Flippen sand production was found in a new pool about 2 miles south of the Akard field and also in a ¼-mile extension to Griffin (p. 56).

SOUTHWEST TEXAS: Gas and distillate have been found on the east flank of the Agua Dulce field. Following the discovery of oil on the southeast flank of the structure, an active leasing campaign is developing. Marine activity includes a well being tested in Aransas Bay and a new operation in St. Charles Bay. Magnolia's La Gloria well, which was originally a distillate well, was shut down pending completion of a recycling plant. On reopening, it produced crude (p. 73).

LOUISIANA GULF: A new sand is opened in the Iowa field at 7,570 ft., or about 650 ft. above the deep pay. As other wells which have reached the deep pay have missed this sand, it is concluded that it is in a fault block. The second well in the shallow Ritchie field, Acadia Parish, flowed 150 bbl. The discovery was a small well which later went to water and the well was completed as a gasser (p. 79).

WEST TEXAS: Recent discovery of oil in the Simpson sand in the Abell field of northern Pecos County together with expiration of some of the surrounding leases has started an active drilling campaign near the discovery. Gulf's Silurian well in Ward County gaged nearly 1,600 bbl. in 8 hours (p. 54).

CALIFORNIA: Richfield's interesting Eocene discovery near Wheeler Ridge proved a disappointment when it was completed flowing salt water. The water is thought to be coming from the base of the sand. In Rosecrans a well came in unexpectedly out of control from what is thought to be the equivalent of the eighth Callender zone at Dominguez, although a ninth zone may have been tapped. This well may lead to the deepening of a number of wells producing from higher zones to the west (p. 65).

ILLINOIS: More than the usual number of dry holes were reported in Illinois as wildcatters finally abandoned wells that had long been inactive, in addition to the usual number. White County activity continues to lead the state, although by far the best well marked a 1-mile north extension to the West Liberty pool in Jasper County (p. 77).

MICHIGAN: One producer in the Walker pool, a near failure in Columbia and 13 dry holes mark one of Michigan's poorest weeks. Gulf's announcement that they will continue to drill their deep test is of great interest, particularly as traces of oil were found with gas in the Salina after the fire had been extinguished (p. 81).

OHIO: The old Clinton gas area is becoming more active as good gassers are completed in Knox County, near Danville (p. 76).

OKLAHOMA: Attempts to maintain production in the Ramsey pool by plugging back depleted Wilcox wells and recompleting in the Hunton received a setback as the first test began making water. The program is working successfully in the neighboring Coyle pool (p. 59).

NEW MEXICO: The Wills shallow gas field, discovered last year in eastern Eddy County, has been extended 5 miles to the west (p. 54).

WEST VIRGINIA: A 1,000,000-cu. ft. gas well in the Ravenswood district of Jackson County may mark a new Oriskany pool or 3-mile extension of the famous Kanawha gas field (p. 72).

ROCKY MOUNTAIN STATES: Drilling activity is now at a minimum owing to heavy snows and many operations are expected to remain shut down until spring (p. 68).

TEXAS PANHANDLE: After 3½ years of intermittent activity, including plugging back and testing several zones above the 6,274-ft. total depth, a test in Ochiltree County is abandoned (p. 54).

COMPLETIONS IN ALL FIELDS . . .

(Week ended December 14, 1940)

	Oil	Gas	Dry	Total	1940 total comp. to date	1939 total comp. to date
N. Y., Pa., and W. Va.	69	22	6	97	5,655	3,480
Ohio	6	16	6	28	1,183	851
Indiana	5	3	8	16	476	337
Kentucky	4	4	6	14	496	694
Illinois	46	0	30	76	3,661	3,525
Michigan	2	0	13	15	1,111	1,407
Kansas	27	0	4	31	1,715	1,323
Oklahoma	12	1	8	21	1,710	1,679
Texas:						
North Central Texas	18	0	13	31	2,724	2,373
West Texas	28	0	4	32	1,733	1,776
Texas Panhandle	8	2	2	12	550	433
Eastern Texas	14	0	3	17	610	672
Texas Gulf Coast	18	0	4	22	1,176	1,302
Southwest Texas	21	1	18	40	2,000	2,328
Total Texas	107	3	44	154	8,805	8,875
North Louisiana	12	3	8	23	648	516
Louisiana Gulf Coast	9	0	5	14	972	719
Total Louisiana	21	3	13	37	1,620	1,235
Arkansas	2	0	1	3	178	241
Montana	3	0	0	3	227	168
Wyoming	3	0	1	4	160	136
Colorado	0	0	1	1	18	20
New Mexico	7	1	1	9	511	566
California	16	0	1	17	971	889
Miscellaneous	2	0	1	3	229	64
Total United States	332	53	144	529	28,714	25,492
Total previous week	355	49	103	507		
Week ended Dec. 16, 1939	419	45	133	597		

Abell Field in Northern Pecos County to Be Rapidly Drilled

By R. MARNE SANFORD

MIDLAND, Tex., Dec. 16.—A drilling program which is expected to include at least six tests was seen for the recently opened Abell field in northern Pecos County at the close of the past week. Also leading in importance from the district was the official gaging of the discovery well in a shallow field opened just northwest of the Apco field in Pecos County and the official gaging of the Gulf 5 Wristen Brothers, deep Silurian discovery of last week in Ward County.

Magnolia Petroleum Co. holds a number of close-in leases which are due to expire during the early months of 1941. Magnolia has already staked locations for two tests in the area, both northwest of the discovery, and plans to locate several more during the coming few weeks. The discovery well for the field was Taubert-McKee-Siemoneit Drilling Co., Fort Worth, 1 V. W. Crockett, completed only a few weeks ago to open the first Simpson (Ordovician) field for West Texas. Of the two locations already made by Magnolia in the area, 1 Markley will be drilled first. Also from the accompanying map it may be seen that Magnolia has added considerable acreage to its block in the area, it having taken some 1,000 acres near the discovery well during the past 2 weeks.

Pecos Shallow Discovery Gaged

Completion gage is reported for M. D. O'Quinn (formerly R. G. Patillo) 1 O'Neill, Section 74, Block 10, H.&G.N. Survey, shallow discovery of 2 weeks ago just northwest of the deep Apco field. The discovery was started by Patillo as an Ordovician test but was taken over by O'Quinn for completion when a section of saturation was found from 1,607-75 ft. The pay was given a 140-qt. shot and registered a daily potential of 23 bbl. of 34-gravity oil, flowing, through ¼-in. choke, in 24 hours. The discovery tract of acreage as well as the test itself were taken over by the new operator and immediate development is forecast for the new field.

Silurian Discovery

A daily potential of 3,049 bbl. of 34-gravity sweet oil was assigned the Gulf Oil Corp. 5 Wristen Brothers,, deep discovery from the Silurian age rocks just south of the Shipley field in Ward County. The well flowed 833.35 bbl. of oil the first 6 hours and 762.25 bbl. the second 6 hours of a 12-hour test, the daily rating being figured from four times the second 6 hours' flow. The flow was through both open tubing and open casing The field will be named Shipley Deep, it being just south of the regular shallow Shipley field. The test is bottomed at 7,075 ft., plugged back from a total depth of 9,187 ft., and found its main pay section from 7,018-60 ft.

The definite top of the Silurian section was not called, but it is known to be between 6,930 ft. and 6,970 ft. Top of the Montoya, Upper Ordovician was at 7,200 ft., the Simpson of Middle Ordovician at 7,400 ft. and the Ellenburger of Lower Ordovician at 9,002 ft. The lower part of the hole was junked when drill stem and packers and testing tools were lost and after several attempts at sidetracking the hole had failed. Gulf 5 Wristen Brothers was acidized with 3,000 gal. and with 6,000 gal. after first having been washed with 1,000 gal. It is located 330 ft. from the east corner of W Section 18, Block 5, H.&T.C. Survey.

Crane County

A new deep wildcat has been staked in southern Crane County and between the new Abell field in the southern part of the Sand Hills field in Crane County. It is Gulf 17 Waddell, C E E Section 15, Block 3, H.&T.C. Survey, 4½ miles south and slightly west of production in the southern part of the Sand Hills field and about 8 miles north of the new Simpson production in the Abell field of northern Pecos County. The only deep failure in the area between these two deep fields is the Moore Brothers 1 Barnsley, 6,829-ft. failure about 2½ miles to the east of the new location.

SUMMARY OF COMPLETIONS

Northern West Texas

	No.	Prod.	Footage
Oil wells: Slaughter-Duggan	2	1,965	9,985
Wasson field	7	5,877	30,854
Seminole	2	1,125	10,450
Dry holes: Means field	1	.....	4,546
Wasson	1	.....	4,850
Total	13	.....	60,685
Recompletions: Wasson field	5	7,974	.....

Southern West Texas

	No.	Prod.	Footage
Oil wells: Ector County fields	7	5,908	29,613
McElroy field	2	3,752	5,692
Estes field	2	1,991	5,369
Noelke field	1	13,440	1,146
Other fields	5	1,226	14,400
Dry holes: McCamey field	1	.....	2,750
Taylor-Link field	1	.....	1,628
Total	19	.....	60,598

Texas Panhandle

	No.	Prod.	Footage
Oil wells: Pampa field	2	299	6,421
Stinnett field	2	385	6,056
Borger field	3	635	9,220
Other fields	1	195	3,128
Gas wells: Pampa and Stinnett	2	*11.2	5,970
Dry holes: Shamrock field	1	.....	2,265
Wildcat	1	.....	6,274
Total	12	.....	39,334

Southeast New Mexico

	No.	Prod.	Footage
Oil wells: Fields	7	1,683	22,271
Dry holes: Wildcat	1	.....	1,758
Gas wells: Wildcat discovery	1	*5	1,848
Total	9	.....	25,877

*Million cu. ft.

SOUTHERN WEST TEXAS COMPLETIONS

Crane County

McCamey field: Texas 47 King, dry at 2,750 ft., water.

Crockett County

Todd Deep field: Continental 6-B Todd, 86 bbl., pumping, 8 hrs., 7,000 gal. acid, top Crinoidal lime 5,877 ft., T.D. 5,928 ft., plugged back 5,914 ft.

Noelke field: Pittman & Cox 1 Noelke, 280 bbl., natural, in 30 min., 3-in. outlet from casing, 1,136-46 ft.

Ector County

Foster field: Atlantic 3 L. E. Brock, 1,507 bbl., open tubing, 720 qt. shot, 3,870-4,120 ft.

Cities Service 10 Rhodes, 1,997 bbl., open tubing and casing, 350 qt. shot, 4,075-4,195 ft.

Goldsmith field: Gulf 322 Goldsmith, 135 bbl., gas lift, 77-qt. shot, 4,138-4,223 ft.

Johnson field: I.T.I.O. 2-E Johnson, 604 bbl., 1-in. choke, 210 qt. shot, 4,040-4,155 ft.

Ohio Oil 2 Johnson, 627 bbl., ½-in. choke, 400 qt. shot, 4,040-4,148 ft.

North Cowden field: Carl B. King 1 Holt, 714 bbl., open tubing, 160 qt. shot, 4,280-4,315 ft.

Texas Co. 4 Holt, 324 bbl., ¾-in. choke, 575 qt. shot, 4,405-4,457 ft.

Pecos County

Taylor-Link field: Eastham 3-A University, dry at 1,628 ft.

Eastham 4-B University, 168 bbl., pumping, natural, 1,573-1,606 ft.

Upton County

McCamey field: Kimberlin 1 Bowen, 50 bbl., natural, tubing, 1,700-16 ft.

O'Neil field: Quinn 1 O'Neil, 23 bbl., ¼-in. choke, 140 qt. shot, 1,607-75 ft.

McElroy field: Gulf 46 Crier-McElroy, 1,378 bbl., open casing, 650 qt. shot, 2,634-2,824 ft.

Gulf 232 McElroy, 2,374 bbl., open casing, 610 qt. shot, 2,698-2,868 ft.

Ward County

Estes field: Gulf 140 Estes, 1,724 bbl., open casing, 460 qt. shot, 2,530-2,688 ft.

Gulf 149 O'Brien, 267 bbl., open tubing, 350 qt. shot, 2,-550-2,681 ft.

Winkler County

Keystone field: Gulf 39 Kevstone, 729 bbl., open casing, 470 qt. shot, 3,325-3,475 ft.

NORTHERN WEST TEXAS

Attention in the northern part of West Texas was turned on several wildcat tests throughout the area. The two deep exploratory tests being drilled in the center of the original Denver field of northern Gaines County are still drilling ahead. Amon G. Carter 4-D Wasson, NW SE Section 50, Block AX, P.S.L. Survey, was last reported drilling below 9,025 ft. A new permit has been granted for a 10,000-ft. test. No information has been released on the deep test since it encountered two zones showing oil at 6,580 ft. and 7,020 ft., respectively. As a south offset to this test the same operator is drilling below 6,100 ft. at 5-D Wasson, being deepened to test the shows found in 4-D Wasson.

Andrews County was given a new wildcat operation during the week when Fuhrman Petroleum announced location for 1 Lockhart & Brown, 467 ft. out of the NE cor. Section 24, Block 42-A, P.S.L. Survey. It is about 2½ miles west of the Fuhrman field and 1¾ miles southeast of a failure by Maer & Staniforth on the Taylor lands.

Terry County

About 3 miles west of the Terry County portion of the large Slaughter-Duggan field Gulf Oil Corp. is drilling ahead below contract depth at 4 Mallett, 440 ft. from the south and 1,631 ft. from the east lines of Section 5, Block X, P.S.L. Survey. At last reports the hole was at 5,776 ft. or about 376 ft. below the contract depth of 5,400 ft. Only slight streaks of saturation were found in the regular Slaughter field pay zone.

Another test drilling below contract depth of 5,400 ft. is Sloan & Zook 1 Bailey, NW cor. Section 103, Block 4-X, C.&M. Survey, 4 miles northeast of Wellman. It is below 5,520 ft.

NORTHERN WEST TEXAS COMPLETIONS

Andrews County

Means field: Humble 29 R. M. Means, dry at 4,546 ft.

Gaines County

Seminole field: Amerada 2 Turlin, 607 bbl., ½-in. choke, natural, 5,126-5,285 ft.

Skelly 4 Mann, 518 bbl., ½-in. choke, 6,000 gal. acid, 5,100-5,255 ft.

Wasson field: Continental and Carter 7-48 Wasson, junked at 4,850 ft.

Continental and Carter 8-48 Wasson, 861 bbl., ¾-in. choke, 6,000 gal. acid, 4,910-5,030 ft.

Hockley County

Slaughter field: Bass & Dillard 2 Slaughter, 1,159 bbl., open casing, 8,000 gal. acid, 4,900-5,000 ft.

Texas Co. 12 Slaughter, 806 bbl., open casing, 8,500 gal. acid, 4,920-85 ft.

Yoakum County

Wasson field: Aloco Oil 9 Keller, 516 bbl., tubing, 10,-000 gal. acid, 4,860-5,201 ft.

Basin States Oil 4 Fisher-Walker, 1,529 bbl., 2-in. choke, 10,000 gal. acid, 5,020-5,200 ft.

Carter and Continental 8 Willard, 1,612 bbl., 1-in. choke, 9,000 gal. acid, 4,880-5,045 ft.

Humble 8 Randall, 567 bbl., ⅞-in. choke, 14,000 gal. acid, 5,083-5,102 ft.

Mabee Oil & Gas 2-D Willard, 455 bbl., 40/64-in. choke, 10,000 gal. acid, 4,980-5,191 ft.

Shell 1-B Hudson, 337 bbl., open tubing, 10,000 gal. acid, 4,900-5,115 ft.

Shell 1 H. L. Lowe, old T.D. 5,024 ft., old top pay 4,900 ft., deepened to 5,128 ft., new initial 1,671 bbl., open tubing, 5,000 gal. acid.

Shell 2 Lowe, old T.D. 5,045 ft., old top pay 4,850 ft., deepened to 5,135 ft., new initial 1,572 bbl. open tubing, 5,000 gal. acid.

Shell 3 Lowe, old T.D. 5,055 ft., old top pay 4,860 ft., deepened to 5,140 ft., new initial 1,811 bbl., open tubing, 5,000 gal. acid.

Shell 4 Lowe, old T.D. 5,062 ft., old top pay 4,862 ft., deepened to 5,157 ft., new initial 1,432 bbl., open tubing, 5,000 gal. acid.

Shell 5 Lowe, old T.D. 5,055 ft., old top pay 4,855 ft., deepened to 5,160 ft., new initial 1,488 bbl., open tubing, 5,000 gal. acid.

TEXAS PANHANDLE

AMARILLO, Tex., Dec. 16.—Completions in the Texas Panhandle field totaled 12 during the past week, there being eight new oil wells, two new gas wells and two dry holes. One of the failures was the 4-year-old wildcat in Ochiltree County by J. R. Macon on the Norris, spudded in March of 1937.

No. 1 Norris was quit after having drilled at one time

(Continued on Page 71)

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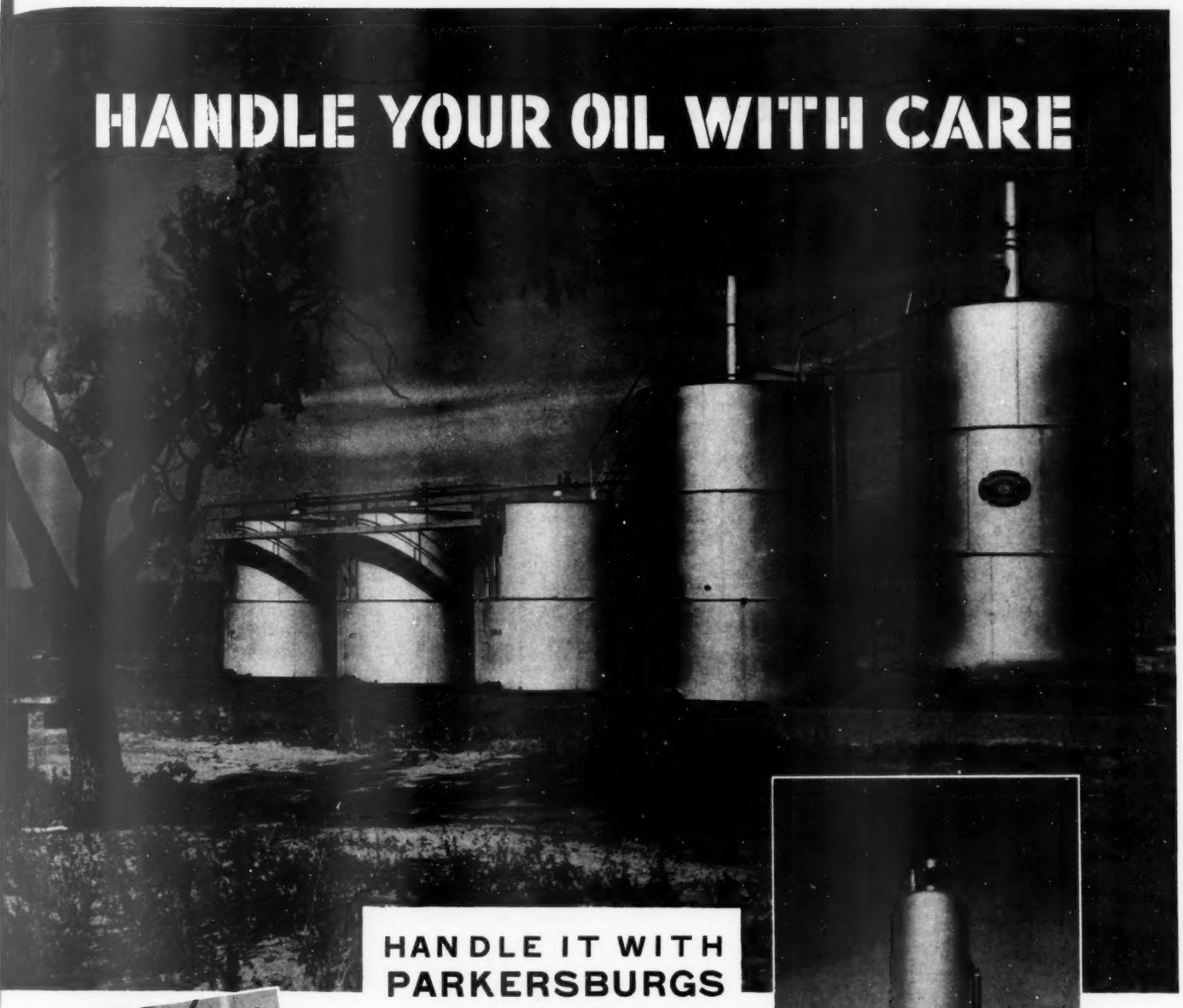

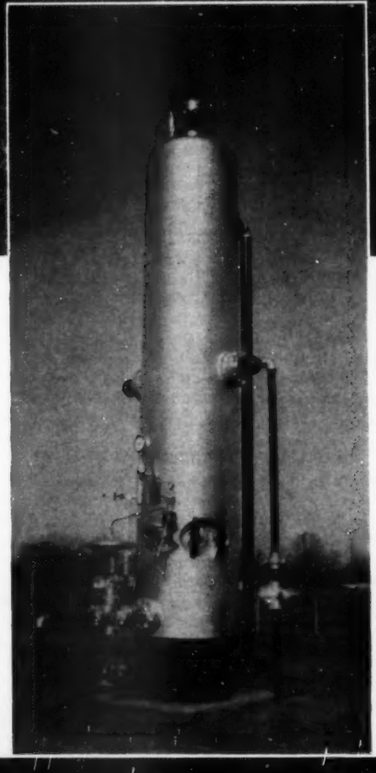

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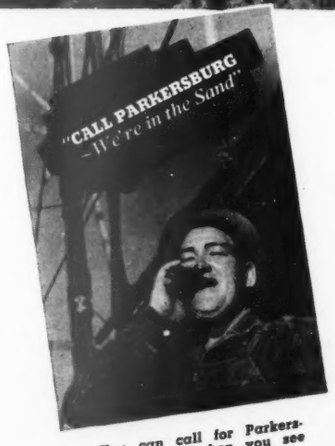

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NORTH CENTRAL TEXAS

By
R. MARNE SANFORD

Find Probable Extension to Seymour Field, Baylor Co.

WICHITA FALLS, Tex., Dec. 16.—Baylor County's Palo Pinto lime play which started in January 1939 with the discovery of the Seymour field by British American Oil Producing Co. and was further aided in April 1940 by the discovery of another Palo Pinto field by Hall-Jordan Oil just 4 miles to the southeast, has again been advanced by the opening of a third Palo Pinto lime field, this one about 2½ miles north of the Seymour field.

The new discovery is British American Oil 1 C. Cowan, Section 198, T.&N.O. Survey, and will undoubtedly at some future date prove to be a part of the first field opened by that company. The Seymour field now has 17 producing wells and the Hall-Jordan field has 3 wells, all from the Palo Pinto lime which is the bottom member of the Canyou series of Pennsylvanian age rocks. The discovery, 1 Cowan, located about 11 miles northeast of the town of Seymour, was completed for a flow of 333 bbl. of oil in 10 hours through open tubing, or at the rate of about 825 bbl. daily. Pay section was logged from 2,518-22 ft., total depth. The lime was treated with 2,500 gal. of acid prior to official gage. Following its course of rapid development for the area, the discovery company has staked both a northeast offset and a northwest offset and is preparing to locate a south offset.

The original discovery well for the Seymour field was British American Oil 1 E. C. Green, Section 215, T.&N.O. Survey, about 9 miles east of Seymour. It made 260 bbl. of oil and 190 bbl. of water daily from the Palo Pinto lime from 2,580-2,605 ft., one of the lowest wells drilled in the entire field to date.

SUMMARY OF COMPLETIONS

North Texas

	No.	Prod.	Footage
Oil wells: K.M.A.	3	1,652	12,033
Olney	3	30	2,336
Other fields	7	4,163	20,363
Dry holes: Fields	4	.....	4,878
Wildcats	2	.....	11,150
Total	19	.....	50,760

West Central Texas

	No.	Prod.	Footage
Oil wells: Fields	5	544	12,742
Dry holes: Fields	3	.....	6,727
Wildcats	4	.....	9,863
Total	12	.....	29,332

New Deep Wildcats

The Hall-Jordan field discovery was 1 F. C. Green, C N½ SE 40 acres of J. E. Hix Survey, about 4 miles southeast of the limits of the Seymour field. It made 184 bbl. in 6 hours, or approximately 736 bbl. daily from 3,061-64 ft., a slightly lower stratum of the Palo Pinto lime. Two of the deep wildcats for the week were in the vicinity of the recently opened and rapidly developing Vogtsberger field of northeastern Archer County. About 2 miles southeast of the field the Walter Gant and Barney Feagan 1 Hunter, Section 7, Block 1, H.&T.C. Survey, after topping the Caddo lime at 5,133 ft., and drilling to its projected depth of 5,300 ft. without encountering saturation, is being carried ahead as an Ellenburger lime test. Some streaks of saturation were found from 5,155 to 5,208 ft. but did not warrant testing. It is now drilling below 5,400 ft.

As a 2-mile-northwest outpost to the field Gibson & O'Donohoe of Wichita Falls have staked 1 Herman Jentsch, a projected 4,800-ft. test to the regular pay of the field. It is located 330 ft. out of the northeast corner of the Herman Jentsch Survey, and about a mile southeast of the three small producers on the State Hospital lands by Petroleum Producers and Continental.

As a ¾-mile-northeast outpost to the field Gant and Feagan have located 1 Vogtsberger, 574 ft. from the north and 366 ft. from the west lines of the north 100 acres of Block 9, G.E.L. Survey.

Montague County is scheduled for a new 6,000-ft. wildcat about 2 miles northeast of the town of Ringgold and about 4 miles northeast of the Ringgold field. W. B. Omohundro, Wichita Falls, has closed a deal with M. T. McLaughlin for a 2,000-acre block which the latter assembled and a deep test is due to start within a few weeks. The proposed location will be 1 I. V. Parr, 1,400 ft. from the south and 467 ft. from the west lines of a 500-acre tract in the T. G. Simmons Survey.

NORTH TEXAS COMPLETIONS

Archer County

Hull-Silk field: Bert Ligon 2 White "C", 382 bbl., 3,858-3,912 ft.

Clay County

Wildcat: Phillips Pet. 1 K.N.&L.P. Hapgood, dry at 6,520 ft.
Thornberry field: Johnson & Kouri 2 Taylor "39", 10 bbl., 1,136-55 ft.
N. H. Martin & Son 1 Brannon, dry at 1,836 ft.
Antelope field: Shell 3 Coburn, 1,494 bbl., 3,230-30 ft.

Cooke County

Cooke field: W. H. Metzner 1 Eberhart, dry at 930 ft.
Walnut Bend field: Sun Oil 8 Snuggs, 200 bbl., 4,890-4,919 ft.
Muenster field: J. B. Wilde 1 Hesse, dry at 1,467 ft.

Montague County

Bonita field: Sinclair Prairie 2 Admire, 1,986 bbl., 5,234-48 ft.

Wichita County

K.M.A. field: Deep Oil Dev. & Continental 1 Strauss, 935 bbl., 3,840-95 ft.
C. O. Doss 1 Perkins, 93 bbl., 3,924-4,124 ft.

Wilbarger County

Wildcat: O. M. Stidham & Son 1 C. D. Watts, dry at 4,630 ft.
K.M.A. field: Waggoner Refg. 5 Waggoner "GG", 624 bbl., 3,967-4,014 ft.

Young County

Larimore field: L. T. Burns 2 Larimore, 11 bbl., 868-81 ft.
Olney field: B. C. Gilmore 1 McDavid, dry at 645 ft.
W. Hunt 11 Gass, 6 bbl., 1,220-25 ft.
Chas B. King 1 Brown, 9 bbl., 535-58 ft.
Chas. B. King 2 Brown, 15 bbl., 535-53 ft.

WEST CENTRAL TEXAS

FORT WORTH, Tex., Dec. 16.—Jones County was being promised a new Flippen sand field at the close of the week by Danciger Oil & Refinery 1 Kelso, a wildcat test about 6 miles southwest of the Hawley field, and about 2 miles west of the Akard field.

The 1 Kelso drilled saturation in the Flippen sand, the same producing horizon as found in the Akard field, from 2,336-38 ft., and cemented casing for tests. Prior to setting casing the hole filled at the rate of 8 bbl. an hour. The hole was started as a 2,800-ft. Swastika sand test; thus should commercial production result from 1 Kelso it is expected that another 2,800-ft. test will be started to explore the deeper levels. The plug is scheduled to be drilled early this week for production gages. The well is located 882 ft. from the west and 330 ft. from the south lines of Lot 82, Godwin Subdivision, De Witt County School Lands, in the extreme southern part of Jones County.

Another Flippen sand field attracted attention during the week as a ¼-mile extension was found in the area just north of the Griffin field in northeastern Jones County. This sector was recently opened by Jones & Stasney 1 Humphrey. The new extension is Iron Mountain Oil 1 Peterson, Section 192, B.B.B.&C. Survey, just north of the recently abandoned Humble 1 Rosenwasser. It found saturated lime from 1,715-29 ft., total depth, and was treated with 1,000 gal. of acid. No initial gages have yet been released.

South Carbon Field

Considerable developmental activity is progressing in the South Carbon (Dobbs) field just south of the town of Carbon in Eastland County. Two wells were brought in the past week and three locations have been staked. Indicating the largest well for the field, Gallagher & Lawson 1 Morris, Hardy Survey, is being prepared for a shot in the lime pay from 2,533-42 ft. Plug was drilled from casing set at 2,533 ft. and the well showed for a good producer natural but is being shot following the regular completion practices of the field. On the north side of the field Dobbs Oil 2 Thomason, two locations east of the recently completed large Mahaney 1 Jackson, is testing after being shot with 280 qt. from 2,580-2,654 ft. in the Caddo lime pay of the field.

A recent starter for the field was C. L. Mahaney 2 Jackson, Key Survey, which was last reported drilling below 1,200 ft. West of Gallagher & Lawson 1 Morris, Harry Moss has staked an outpost location in the A. S. Jackson lands, I.&G.N. Survey. The third location for the field is Gallagher & Lawson 1-B Morris, a location east of the operator's well which is being completed.

The field was opened about 1½ years ago by Dobbs Oil Corp., Dallas, but was not developed until the completion only a few months ago of Mahaney 1 Jackson which made 797 bbl. of oil in 24 hours to definitely indicate the presence of an important field.

WEST CENTRAL TEXAS COMPLETIONS

Brown County

Cross-Cut field: M. R. Hart 1 Teague, dry, 1,271 ft.
Grace Eakin 4 Williams, abandoned location.

Callahan County

Wildcat: N. D. Gallagher 1 Grisson, 2,300 ft. from N and 220 ft. from E line, Sec. 2, Blk. 8, S.P. Sur., T.D. 1,775 ft., dry, casing 10-in. 691 ft., 8⅛-in. 1,203 ft., 6⅝-in. 1,703 ft., 5 5/16-in. 1,718 ft.

Coleman County

Echo field: J. C. Ort 1 Walker, top Adams Branch lime 1,330 ft., top Morris sand 1,896 ft., 10-qt. shot from 1,904-16 ft., 33 bbl. pumping in 24 hr.
Wildcat: States Oil 1-B Morris, 1,401 ft. from S and W lines of S. A. Carroll Sur. 38, top Ellenburger 4,233 ft., show gas 4,258-61 ft. and 4,357-62 ft., salt water at T.D. 4,375 ft., dry.

Eastland County

Desdemona field: F. Kirk 1 Gilmore, 70 bbl., 120-qt. shot, 2,747-87 ft.

Jones County

Nowles field: J. C. Hunter 1 Minter, show oil 1,969-75 ft., 1,975-80 ft., and 2,200-05 ft., dry at 2,521 ft.
Akard field: Ungren & Frazier 1-A Akard, 177 bbl., ¾-in. choke, 2,126-35 ft.
Wildcat: T. D. Humphrey 1 Leslie Lipham, 1,950 ft. from N and 3,400 ft. from E lines, Sec. 18, Blk. 15, T.&P. Sur., dry at 2,751 ft., casing 12½-in. 56 ft., 10-in. 625 ft., 8¼-in. 1,791 ft., 6⅝-in. 2,417 ft., 5 5/16-in. 2,729 ft.

Stephens County

Loving field: Swadmo Oil 1 McCauley, 10 bbl., pumping, 15,000 gal. acid, 3,439-3,512 ft.

Tarrant County

Wildcat: J. M. Hickey 1 Baltzell, 990 ft. from N and 330 ft. from E lines of William Scott Sur., junked at 935 ft.

Taylor County

View field: S. & B. Oil 2 Fain, 254 bbl., open tubing, 1,000 gal. acid, 2,367-92 ft.
Dunigan field: Eastland Oil 1 Bigham, dry at 2,935 ft.

Majors Interested in Westwego Area

Titanic 1 Marrero, a prospective pool opener located in the Westwego area, Jefferson Parish, is drilling in shale in sidetracked hole below 7,993 ft. This well blew out from a depth below 9,900 ft. several weeks ago and flowed an unestimated amount of gas and distillate which resulted in the hole being plugged back and sidetracked. A new operation is expected to be started in this area in the near future by Shell Oil Co. Inc., which acquired leases on 55 acres from the Public Bel Railroad Co., and agreed to start drilling operations within 15 days. The company paid $15,900 cash and a yearly rental of $7,950, plus the one-eighth royalty and a one forty-eighth override. The present test is being drilled on a farmout lease from Shell Oil Co., Inc., which controls several thousand acres in the area. Close-in protection is also held by Stanolind Oil & Gas Co., Phillips Petroleum Co., and several independent operators.

By
STAFF CORRESPONDENT

Ends of Cumberland Pool Are Indicated by Small Wells

TIP-END wells in the Cumberland area of Marshall and Bryan counties continued to make small producers while at the same time defining the trend. On the extreme northwest tip, Pure 1 Crissman-104, NE NE NE 39-5s-7e, in Marshall County, was making 75 to 120 bbl. a day by heads while agitating with cable tools. The total depth was 5,063 ft.

On the southeast tip in Bryan County, Pure 1 Park College, SW SW SE 27-5s-7e, was pumping about 1 bbl. an hour after being plugged back to 5,118 ft. The company's 4 Little-100, NE NW SE Section 28, set 7-in. pipe at 4,867 ft., total depth 4,876 ft. It will be deepened somewhat after drilling the plug before testing.

The 3 Little-101, SW SW NE 28-5s-7e, was below 4,950 ft. after drilling out the plug.

Dill Pool Extension

Cromwell sand production of the Dill pool of Okfuskee County was extended northwestward at the John Droppleman et al 5 Dill C, NW NE SE 34-12-8, which flowed 60 bbl. an hour for 5 hours. The Cromwell zone was topped at 3,559 ft., and the sand at 3,562 ft. Total depth is 3,580 ft. Fourteen feet of sand was recovered in a core from 3,565-80 ft.

Droppleman interests also started at the 3 Dill A, NW SE SE 34-12-8, on the west edge of the Droppleman northwest extension to the pool, two locations south of No. 5-C.

Shell 4 Curry, SW NW 35-12-8, flowed 137 bbl. of oil in 3 hours and 50 minutes at a total depth of 3,601 ft. in shale.

SUMMARY OF COMPLETIONS

	No.	Prod.	Footage
Oil wells: Cumberland	1	*29	5,231
Dill	1	*1,746	3,582
Other fields	10	*1,633	27,563
Gas wells: Wildcats	1	†1.5	1,093
Dry holes: Hewitt	2	.....	5,459
Other fields	3	.....	5,975
Wildcats	3	.....	19,258
Total	21	.....	68,161
Recompletions	4	2,258	.....

*Barrels. †Million cu. ft.

West Hewitt

Three wells were completed as new work was getting under way in the west extension area of the old Hewitt field in Carter County. Gibson & Jennings 5 Mertens, SW NW SE 20-4s-2w, made 8 bbl. a day after a 40-qt. shot in the pay zone at 1,940-65 ft. John Steele Batson 7 Williams, NW NE SE 20-4s-2w, did 130 bbl. the first 24 hours after a 50-qt. shot in the pay zone at 2,065-96 ft. Porterfield et al 1 Walker-Voorhees, NE NW NE 20-4s-2w, was estimated at 175 bbl. a day after a 50-qt. shot at 2,114-54 ft.

Ramsey Plug-Back Finds Water

Mid-Continent 1 Nottingham, NW SE 18-18-2e, may prove that the Hunton lime in the Ramsey pool area will not be as promising as was first believed. The test, which was plugged back to the Hunton lime at 4,615-33 ft., where it was perforated, pumped 62½ bbl. of oil and 15 bbl. of salt water in 24 hours at last report.

The test at first pumped 84 bbl. of water-free oil in 15 hours. Although the salt water has shown in the zone, operators are continuing to test.

Sun 1 Collins, in 12-17-1e, in the Coyle pool of Payne County, had a good but unestimated flow of oil from the Hunton lime. The test, drilled in 1939, produced from the Wilcox sand but was plugged back recently for heavier pay. The plug-back depth is 4,600 ft. and the old total depth was 4,890 ft.

No. 2 Collins, west offset to 1 Collins, flowed 13 bbl. of oil the first hour, 62 bbl. the second hour and 78 bbl. on the third hour from a total plug-back depth of 4,730 ft. in the Hunton lime. Its old total depth was 4,900 ft. Indications are that the No. 1 will at least parallel the offset in the newly found production.

AVERAGE DAILY PRODUCTION

LEADING OKLAHOMA FIELDS

	Dec. 14	Dec. 7
Allen	4,950	5,000
Billings	6,225	6,225
Burbank	7,375	7,425
South Burbank	7,300	7,300
Balance Osage	17,100	17,250
Blackwell district	3,350	3,350
Bristow-Slick	6,250	6,300
Chandler	1,050	1,050
Crescent	2,050	2,075
Cromwell	2,925	2,950
Cushing-Shamrock	9,225	9,250
Duncan	3,525	3,550
Edmond	3,925	3,925
Fish	2,950	2,975
Fitts	12,400	16,850
Jesse	1,850	2,050
Graham-Fox	2,300	2,275
Gray	825	850
Healdton	8,400	8,475
Hewitt	7,200	6,100
Keokuk	2,875	2,900
Konawa	1,100	1,100
Lucien	6,800	6,850
Moore	1,100	1,125
Northeastern counties	17,850	18,400
Oklahoma City	80,100	108,100
Olympic	1,750	1,775
Ramsey	3,500	3,600
Sasakwa	1,450	1,450
Sholem-Alechem	2,575	2,575
Seminole district:		
Bowlegs	6,350	6,375
Carr City	2,100	2,125
Dora	1,725	1,750
Earlsboro	3,850	3,900
East Earlsboro	1,775	1,800
South Earlsboro	450	450
Little River	6,275	6,300
East Little River	650	675
Maud	525	550
Mission	1,175	1,200
Seminole	6,250	6,275
East Seminole	1,075	1,075
Searight	1,925	1,975
Total Seminole	34,125	34,450
St. Louis-Pearson	21,850	22,200
Tatums-Tussy	4,850	4,700
Tonkawa-Garber-Thomas	3,500	3,550
Wewoka	1,525	1,550
Yale-Jennings	3,050	3,100
Total Oklahoma	384,450	419,725

OKLAHOMA COMPLETIONS

Caddo County

Wildcat: Texas 1 Smith, C NE NW 2-5-12w, T.D. 4,396 ft., P.B. to top cement 2,350 ft., temporarily abandoned.

Carter County

Healdton pool: Magnolia 83 Richards, SE SW SE 31-3s-3w, pumped 56 bbl., sand 1,040-1,121 ft.

Hewitt pool: Neustadt 2-A Bennett, SE SW NW 17-4s-2w, dry, T.D. 2,381 ft.

Gibson 1-A Ward, NE SE NE 29-4s-2w, dry, T.D. in lime 3,078 ft.

Gibson 1 Walker NE SW NE 20-4s-2w, deepened from 2,103 ft. to 2,126 ft. in sand, 100-qt. shot, 2,087 ft., pumped 175 bbl.

Cotton County

Walters pool: Red River 1-A Bondurant, C SE SW 24-1s-10w, dry, T.D. 2,166 ft.

Bryan County

Cumberland pool: Pure 1 Park College, SW SE 27-5s-7, pumped 29 bbl., sand 5,072-5,118 ft., 10-qt. shot, 5,090 ft., T.D. 5,231 ft.

Garvin County

Tatums-Tussy area: Cox 3 Pate, SE SW SW 29-1-3w, pumped 60 bbl., sand 1,847 ft., T.D. 2,275 ft.

Jackson County

Altus pool: Aloma 4 Robertson, SW NE SE 15-1-20w, flowed 208 bbl., granite wash 1,350-72 ft.

Matthews 1 Wood, SW NE NE 3-1-20w, dry, T.D. 1,633 ft.

Burnham 8 Hensley, NW SW NW 10-1-20w, flowed 300 bbl. oil and 1,000,000 cu. ft. gas daily, top pay 1,422-28 ft.

Le Flore County

Norris pool: Le Flore 38 Orr, NW SE 6-6-23, dry, broken sand 2,084-2,176 ft.

Okfuskee County

Dill pool: Droppleman 5-C Dill, NW NE SE 34-12-8, flowed 936 bbl. in 11-hr. test, flowed potential 1,746 bbl., Cromwell 3,562 ft., T.D. 3,582 ft.

North Cromwell pool: Titus 2 Sands, SE SE 26-11-8, pumped 170 bbl., Cromwell 3,414 ft., T.D. 3,433 ft.

Cromwell pool: Sunray 1 Replogle-Miracle, SE NW SE 35-11-8, flowed 337 bbl., Cromwell 3,448-3,457 ft.

Oklahoma County

Oklahoma City: I.T.I.O. 36 Trosper Park, NE SW NW 13-11-3w, pumped 35 bbl., Hoover 4,020-39 ft., T.D. 4,146 ft.

Payne County

Wildcat: Oklahoma Gas Plants 1 Hudson, SW SW 35-19-6, flowed 1,500,000 cu. ft. gas, Bruner 786-1,093 ft.

Coyle pool: Texas 5 Minnich, C W½ NE NE 11-17-1, old well plugged back to 4,820 ft., perf. 4,660-83 ft., flowed 317 bbl., 3 hr.

Pottawatomie County

St. Louis pool: Smith 1 Ross, SW SW 32-8-4, flowed 248 bbl., Hunton 3,860 ft., set 7-in. casing 3,867 ft., T.D. 3,896 ft.

Prague pool: Mid-States 1 Wilson, NW NE NW 4-11-6, pumped 115 bbl., sand 3,240 ft., set 7-in. casing 3,248 ft., T.D. 3,283 ft.

Seminole County

Wildcat: H. Phillips 1 Thorn, NW NE NE 3-7-5, dry, T.D. 4,705 ft., Viola 4,500 ft., dense 4,540 ft., dolomite 4,575 ft., Wilcox 4,595 ft., second Wilcox 4,700-05 ft.

North Earlsboro pool: Amerada 1 Davis, SW NE 3-10-5, old well deepened to Wilcox 4,663-87 ft., T.D. pumped 494 bbl. in 20 hr., 30.7 gravity.

Stephens County

Velma pool: Raizen 17 Brown, SE NW SE 2-2s-5w, old well deepened to 1,058 ft., pumped 4 bbl.

Wildcat: Gulf 1 Qualls, C SW NE 23-1-7w, dry, T.D. 10,157 ft. in shale, shows 6,040-56 ft., 6,884-6,929 ft., P.B. 6,100 ft., perf. 6,022-54 ft., water.

Tillman County

Frederick pool: I.T.I.O. 7 Graham, SE NE 1-3s-19w, pumped 104 bbl., Canyon 3,124-32 ft.

OKLAHOMA DRILLING REPORT

Caddo County

Ray Stephens 1 Lankford.....SE SE NW 6-6-9w
Drilling 4,160 ft.

Creek County

Trigg et al 1 Jennings.....NW SW NE 18-16-8
Drilling 775 ft.

Grady County

Atkinson et al 1 Gilks.....NE NE SE 22-5-7w
Drilling 1,910 ft.

Hughes County

Ed Scruggs 2 Black.....NW NE NE 13-9-10
Drilling 2,555 ft.

Don Feagin 1 Fulks.....NE NW SW 8-9-11
S.D. 3,010 ft.

Jefferson County

Danciger 1 Hefner.....SE cor. 3-4s-4w
S.D. 1,943 ft.

Johnson Drlg. 1 Bound.....NW SW SW 13-6s-6w
Show oil 1,842-50 ft., coring 1,850-55 ft.

Kay County

Earl Williams 1-A Trueblood.....NE SE SE 25-25-1w
Drilling 1,160 ft.

Logan County

I. T. I. O. 1 Cronkite.....NE NE NW 22-15-4w
Layton 5,190 ft., drilling 5,224 ft.

Big Chief and Ellison 1 Strange....C SW SE 27-18-4w
S.D. 5,127 ft., perf. in Avant 4,266 ft., water.

Love County

Colvin & Hicks 2 Westheimer. C W½ SE SW 27-6s-2
Running 5-in. casing 2,907 ft.

Muskogee County

Storm Feltz 1 Moore.....NW SE SE 4-14-17
Drilling 1,085 ft.

Okfuskee County

W. J. Curn 1 Harris.....SE SE NE 35-14-18
Drilling 1,445 ft.

W. O. Carte 1 Bucco.....NE NE SE 20-10-12
Drilling 1,265 ft.

Portable Drlg. 1-A Nelson.....NE SE SW 1-11-9
T.D. 4,108 ft., P.B. 3,360 ft., set 5-in. 3,323 ft.

Fred Coogan 1 Davis.....SW SE NE 20-11-9
Mayes 3,727 ft., Woodford 3,858 ft., Hunton 3,871 ft., Viola 4,050 ft., Dense 4,068 ft., show oil 4,082-92 ft., coring 4,092 ft.

Keener O. & G. 1 McKerman.....NW NW NE 26-12-8
Drilling 1,550 ft.

Henry Oil 1 Dugeon.....NE SW SE 36-12-9
Show oil 3,085-89 ft., Cromwell 3,284 ft., T.D. 3,289 ft., rigging up standard tools.

Fain-Porter Drlg. 1 Castle.....NE NW SE 36-13-8
Bartlesville 2,935 ft., Glicrease 3,380 ft., drilling 3,490 ft.

Shell 1 Davis.....SW cor. 18-13-9
Drilling 2,128 ft.

Oklahoma County

Harper-Turner 1 Harper.....NW NW SW 17-14-2w
Drilling 4,680 ft.

Osage County

Brookhaven Oil 1 Osage.....NE NE SW 6-22-8
(Continued on Page 67)

By
STAFF CORRESPONDENT

Shows in Western Wildcats May Extend Producing Area

TWO areas in western Kansas have been the subject of much discussion during the past few years, namely the northwestern extension of the Central Kansas or Barton arch, and the relatively unexplored area to the southwest of that structural trend.

There have been scattered pools in the southwestern part of the state, including the Shallow Water pool of Scott County, Aldrich in Ness County, and oil production in the predominantly gas-producing Cairo and Cunningham pools of Pratt County. An extension to Shallow Water, and a Viola discovery in Pratt County will do much to crystallize interest in this area into activity.

The northwestern Barton arch play has received some encouragement following the discovery of the Ray and Bow Creek pools in Phillips County and by the more recent Marmaton discovery in Graham County. Last week a rank wildcat in Thomas County, 42 miles west of the Graham County discovery and 60 miles west of the nearest producing field, Morel, showed oil. A successful completion here will throw open several hundreds of square miles for prospecting.

SUMMARY OF COMPLETIONS

	No.	Prod.	Footage
Oil wells: Silica	2	117	6,654
Trapp	1	475	3,042
Stoltenberg	1	834	3,267
Bornholdt	1	32	3,350
Hall-Gurney	5	7,741	14,944
Zenith	2	6,000	7,660
Other fields	15	7,853	48,721
Dry holes: Wildcats	4	.....	13,496
Total	31	.....	101,134

Kansas Discoveries

Developments in western Kansas this week were highlighted by four completions which included the twenty-eighth and twenty-ninth discoveries for 1940 in the state. The Atlantic Refining Co. test south of Scott City, 1 Hamlin, W½ SW SW 11-20-33w, has extended production in the Shallow Water pool of Scott County a mile northeast.

The well topped the Mississippian lime at 4,587 ft. and was cored to a total depth of 4,670 ft. Operators reported recovering a 10-ft. core heavily saturated with oil and have set pipe to drill in with cable tools. Successful completion will mark the first extension of this area this year.

Eastern Pratt County gained a new pool in the Viola lime following official completion of the Springrose 1 Kemp, S½ NE NW 12-28-11w, 1 mile south of the Cunningham pool gas production. The well made a potential of 2,940 bbl. a day at 4,260 ft. after acidizing.

Shields 1 Paxton, NE NE NE 11-8-24w, in Graham County pumped 12 bbl. an hour for 24 hours at 3,750-56 ft., total depth. The well topped the Arbuckle lime at 3,465 ft. Oil from this well was being moved by truck to the refinery this week.

In Thomas County, Billings 1 Ryan, E½ NE SE 27-8-32w, showed several bailers from a lime at 3,635-38 ft.

AVERAGE DAILY PRODUCTION
LEADING KANSAS FIELDS

	Dec. 14	Dec. 7
Burrton	7,250	7,300
Ritz-Canton	3,900	3,850
Graber	2,750	2,300
Hollow-Nikkel	1,650	1,450
Voshell	1,800	1,850
Wellington	1,150	1,550
Lorraine	1,300	1,000
Stoltenberg-Wilkins	5,320	2,720
Bloomer	5,400	3,600
Chase	5,150	3,900
Geneseo	4,650	3,300
Silica	17,500	16,500
Keesling	950	400
Wherry	3,700	2,950
Trapp district	15,400	14,000
Balance Russell County	20,450	17,000
Sedgwick County	3,200	3,200
Bemis	8,850	7,600
Burnett	5,350	5,200
Kingman County	790	535
Stafford County	11,695	10,605
Greenwood County	8,100	8,150
El Dorado	7,150	7,200
Total Kansas	199,050	183,100

Gorham Sand Pool

A new pool in the Gorham sand in southern Russell County, 1½ miles due north of the old Davidson pool of Barton County was opened up by the Braden & McClure et al 1 Phillips, N½ NW SE 34-15-11w, where oil rose 900 ft. in a few hours after the well topped the sand at 3,309 ft. A pump is being set for a production test.

KANSAS COMPLETIONS

Barber County

Whelan pool: J. Davis 2 Williams, C NE NW 30-31-11w, potential 516 bbl., chat, T.D. 4,797 ft., P.B. to 4,347 ft.

Barton County

Kraft pool: Carter 3 Hogan, W½ NW NW 11-17-11w, pumped 135 bbl. in 7½ hr., 2,000 gal. acid, Arbuckle, T.D. 3,355 ft.

Texas 2 Burmeister, W½ NW SW 2-17-11w, 2,210 bbl., Arbuckle 3,296 ft.

Silica pool: Gulf 6 Howard, E½ E½ SW 8-20-11w, potential 54 bbl., Arbuckle, T.D. 3,324 ft.

Champlin 3 Clawson, N½ NE NW 17-20-11w, 63 bbl., Arbuckle 3,330 ft.

Beaver pool: Sharon Drlg. Co. 1 Stoskopf, N½ NE NW 21-16-12w, potential 458 bbl., Gorham, T.D. 3,369 ft.

Wildcat: W. O. Allen 1 Benjamin, W½ SW SE 3-19-11w, dry, Lansing 3,205 ft., Sooy 3,434 ft., Arbuckle 3,449 ft., T.D. 3,485 ft.

Continental 1 Karst, NW NE NW 12-16-15w, dry, Lansing 3,159 ft., slight show oil 3,256-62 ft., Sooy 3,397 ft., Arbuckle 3,413 ft., T.D. 3,421 ft.

Butler County

Augusta pool: Cities Service 10 Kirkpatrick, NW NW SE 17-28-4e, 70 bbl. oil and 10 bbl. water, acid, Lansing, 1,940-49 ft.

Cowley County

Weathered pool: Lloyd, Study & Frost 2 Elder, SW NW NE 4-32-3e, 14 bbl., Arbuckle, 3,287 ft.

Wildcat: W. M. McKnab 1 Clark, SE SW 31-30-4e, dry at 2,920 ft., located between Clark and Trees pools.

Ellis County

Koblitz pool: Doley Oil 2 Koblitz, W½ SW NW 23-12-8w, 114 bbl., acid, Arbuckle, 3,676 ft.

Blue Hill pool: Hall A-7 Smith, E½ NW NE 14-12-16w, swabbed 136 bbl., acid, Kansas City, 3,165 ft.

Ellsworth County

Stoltenberg pool: Magnolia 3 Haske, E½ SW SW 5-16-10w, 834 bbl., acid, Arbuckle 3,267 ft.

Marion County

Lost Springs pool: Hauser & Adams 1 Hauser, W½ SW SE 28-17-4e, potential 701 bbl., chat, 2,412 ft.

McPherson County

Roxbury pool: Stelbar Corp. 1 Bethany, E½ NW SE 19-17-1w, potential 258 bbl., 2,000 gal. acid, chat, 2,674-95 ft.

Bornholdt pool: Republic Nat. Gas 3 Johnson, SW NW 19-20-5w, 32 bbl., chat, 3,350 ft.

Ritz-Canton pool: MoKan 4 Suffield, E½ NW SE 25-19-2w, 165 bbl., chat, 2,978 ft.

Rooks County

Laton pool: Broadview 1 Livingood, NW NE 11-9-16w, swabbed 66 bbl., acid, Kansas City, 3,283 ft.

Wildcat: Cities Service 1 Johnston, SW SW NE 5-6-19w, dry, Topeka 2,990 ft., Kansas City 3,300-48 ft., Arbuckle 3,589 ft., granite 3,669-70 ft.

Russell County

Hall-Gurney pool: Skelly 8 Colliver, S½ NE SE 28-14-13w, pumped 1,666 bbl., acid, Kansas City, 2,896 ft.

Skelly 2 Hickey, S½ NW NW 30-14-13w, 1,484 bbl., acid, Kansas City, 2,906 ft.

R. H. Shields 2 G. Miller, E½ SE 31-14-13w, 1,753 bbl., acid, Kansas City, 2,929 ft.

A. Billings 2 Holl, NW SE 21-14-14w, 2,702 bbl., acid, Kansas City, 3,105 ft.

Helmerich & Payne 5 Boxberger, NW NW NE 21-14-14w, 136 bbl., acid, Kansas City, 3,108 ft.

Driscoll pool: Stanolind 1 Driscoll, S½ SE NE 30-15-11w, 281 bbl., acid, Arbuckle, 3,255-66 ft., P.B. to 3,260 ft.

Dubuque pool: Skelly 2 Kluesner, S½ NE 7-15-13w, 265 bbl., acid, Arbuckle 3,342 ft.

Trapp pool: Skelly 2 Anderson, S½ SE NE 21-14-14w, flowed 475 bbl., acid, Kansas City, 3,042 ft.

Stafford County

Zenith pool: Bay 2 McNickle, N½ SE SE 2-24-11w, potential 3,000 bbl., acid, Viola, 3,770 ft.

Stanolind 3 R. Richardson, E½ NE SW 10-24-11w, potential 3,000 bbl., acid, Viola, 3,890 ft.

Bedford pool: Cities Service 2 Heyen, SE NE NW 28-23-12w, 2,209 bbl., 500 gal. acid, Arbuckle, 3,841-51 ft.

KANSAS DRILLING REPORT

Barber County

Derby Oil 1 Hancock . . . . . C SE SE 10-32-12w
Mississippi 4,307 ft., show oil, Viola 4,382 ft., Simpson 4,679 ft., Arbuckle 4,776-4,840 ft., T.D., plugged back 4,450 ft., shot, acidized, swabbing.

Cowley County

Wakefield & Vollmer 1 Durham . . . C W½ NW SE 34-30-3
Drilling 2,755 ft.

Ellis County

Central Pet. 1 Wellbrock . . . . . NW NW NE 32-14-16w
Ft. Riley 2,000 ft., Florence 2,100 ft., Topeka 2,900 ft., drilling 3,038 ft.

Greenwood County

Lewis & Dunn 1 Keller . . . . C E½ NE SW 22-26-13
Bartlesville sand 1,473-78 ft., T.D., set 5-in. casing 1,466 ft., filled and flowed in 20 min., gravity 32.5.

Jefferson County

Caufield & Sullivan 1 Ragan . . . . . SW SW SE 19-10-20
Drilling 940 ft.

McCain & Sherrod 1 Green . . . . . SW SW NW 9-11-19
Drilling 940 ft.

Leavenworth County

McLaughlin 1 Thorp . . . . . C NE NE 27-10-20
Mississippi lime 1,395 ft., drilling 1,507 ft.

Ness County

Aladdin Pet. 1 Jedlicka . . . . . C NE NE 33-20-23w
Topeka 3,345 ft., Lansing 3,711 ft., drilling 4,350 ft.

Reno County

Cities Service 1 Crandall . . . . . NW NW NE 23-23-10w
Drilling 2,118 ft.

Rice County

Hess et al 1 Cole . . . . . SE SE NE 31-20-6w
Show oil 3,420-25 ft., Mississippi lime 3,448 ft., T.D. 3,481 ft.,

Rooks County

Helmerich & Payne 1 Baumgarten . . . . . C E½ SE NW 25-9-19w
Drilling 2,705 ft.

Rush County

Patton Drlg. 1 Werth . . . . . C W½ SW SE 10-16-19w
Ft. Riley 2,195 ft., Florence 2,310 ft., Wreford 2,390 ft., drilling 3,240 ft.

Russell County

Stearns Drlg. 1 Witt . . . . . C S½ NE SW 28-12-16w
Drilling 2,868 ft.

Cities Service 1 Steinle . . . . . NE SW NW 36-14-12w
Drilling 2,185 ft.

Pryor & Lockhart 1 Borrell . . . C N½ NE SE 3-15-11w
Set 7-in. casing 3,115 ft.

Braden & McClure 1 Phillip . . . C N½ NW SE 34-15-11w
Gorham sand 3,307-09 ft., T.D., 400 ft., oil in hole 2 hr.

Saline County

E. B. Shawver 1 Lacquement . . . C E½ SE SW 30-16-1w
Drilling 955 ft.

Stafford County

Zephyr Drlg. 1 Moon . . . . . C S½ SE NW 30-22-13w
Topeka 3,010 ft., Lansing 3,473 ft., base Kansas City 3,740 ft., porous zone 3,595-98 ft., no shows, show dead oil 3,660-68 ft., Sooy 3,740 ft., Viola 3,783 ft., drilling 3,827 ft.

Thayer et al 1 Roach . . . . . NW NW SE 12-22-14w
Drilling 2,022 ft.

FOREST CITY BASIN

Development of the Falls City, Nebraska, area continued with the start of a new test 2½ miles north of the pool. Surface pipe was set this week on the Liberty Development 1 Fehr, NW SE 31-2n-16e, in Richardson County.

The new test is expected to throw additional light on a new structure north of production at Falls City where Campbell and Taylor 1 Will Walmsley made a showing last week. This well, three-quarters of a mile north of production in C SW NW 8-1n-16e, swabbed 30 bbl. of fluid an hour with an oil content of from 5 to 10 per cent.

Skelly 3 Wallraff, C SE NW SE 20-1n-16e, flowed 60 bbl. an hour after treatment with 500 gal. of butane and 1,000 gal. of acid from the Hunton at 2,224-2,251 ft.

NEBRASKA DRILLING REPORT

Richardson County

Marion Travis 1 Stauffer . . . . . SW SW NE 22-1-13
Topeka 465 ft., Lansing 760 ft., base Kansas City 1,020 ft., drilling 2,100 ft.

Pioneer Oil 1 Hough-Hill . . . . . C SE SW 6-1-16
T.D. 2,015 ft., S.D. for casing.

I. T. I. O. 1 Ege . . . . . C NE SE 19-3-16
Lansing 904 ft., drilling 1,200 ft.

Martgan et al 1 Smith . . . . . C E½ NW NW 31-3-16
Lansing 909 ft., drilling 1,610 ft.

Nemaha County

Krone 1 Morehead . . . . . C SE NE 35-4-16
Drilling 1,540 ft.

By GEORGE WEBER

Athens and Lisbon Deep Wells Produce Gas and Condensate

SHREVEPORT, La., Dec. 16.—Two deep wildcats in Claiborne Parish, Louisiana, were this week producing gas and condensate. While each well represents a new discovery, it is probable that neither will be definitely completed in the present productive levels. Both tests encountered other possible production horizons at shallower depths than the currently producing levels, and after production schedules have become settled, operators plan to explore further possibilities.

Athens Field

Skelly Oil Co. and Sunray Oil Co., who purchased the interest of V. A. Hardin in 1 Valentine, Athens wildcat, have not yet made definite plans concerning their new field discovery. The well is bottomed at 6,507 ft., with 5½-in. casing set at 6,430 ft.

The deepest level showing production was perforated at 6,316-33 ft. with 24 shots, and a test with 2-in. tubing and packer set at 6,292 ft. showed an initial gas flow estimated at 25,000,000 cu. ft. through ¼-in. chokes top and bottom. The 8-minute test showed a working pressure of 800 lb. and a bottom-hole pressure of 3,250 lb. In addition to the gas, eight joints of gas-cut mud was recovered.

Since the entire section was perforated, operators planned to squeeze the original perforations and reperforate the base of the sand to determine whether oil existed beneath the gas sand. The squeeze job was completed with the plug set at 6,292 ft. and in drilling out to 6,335 ft. it appeared that the upper section of the sand had been successfully squeezed off, but not the lower part. A second drill-stem test before reperforating substantiated this belief, and the test made an estimated 1,632,000 cu. ft. of gas daily, and an original 15-hour gage showed recovery of 82 bbl. of condensate, showing a gravity of 65.1°.

A later 24-hour gage showed 65.2 bbl. of condensate at approximately the same gas rate, taken on 32/64-in. and 24/64-in. chokes. Tubing pressure stood at 1,550 lb. and separator pressures at 400 lb. Since the well is flowing through perforations in what is believed to be the basal part of the sand, the horizon appears without doubt to be gas-condensate bearing. The current gages give little indication of the well's true performance, since part of the sand is squeezed off. Gas-condensate ratios, likewise will be erratic until the well has completely cleaned itself. It is probable that condensate is forming in the hole, and heading, which will create inaccuracies in the flow rates of gas and liquid. Operators plan to produce the well for a short time and then plug back to upper prospective horizons to attempt to find oil production. The currently producing sand is in the Hosston or Travis Peak formation.

SUMMARY OF COMPLETIONS

North Louisiana

	No.	Prod.	Footage
Oil wells: Caddo	7	*264	11,270
Olla	4	*627	9,289
Nebo	1	*250	3,903
Gas wells: Rodessa	1	†10	6,067
Lisbon	1	†2	9,016
Monroe	1	†7	2,200
Dry holes: Caddo	4		8,723
Wildcats	4		7,682
Total	23		58,150

Arkansas

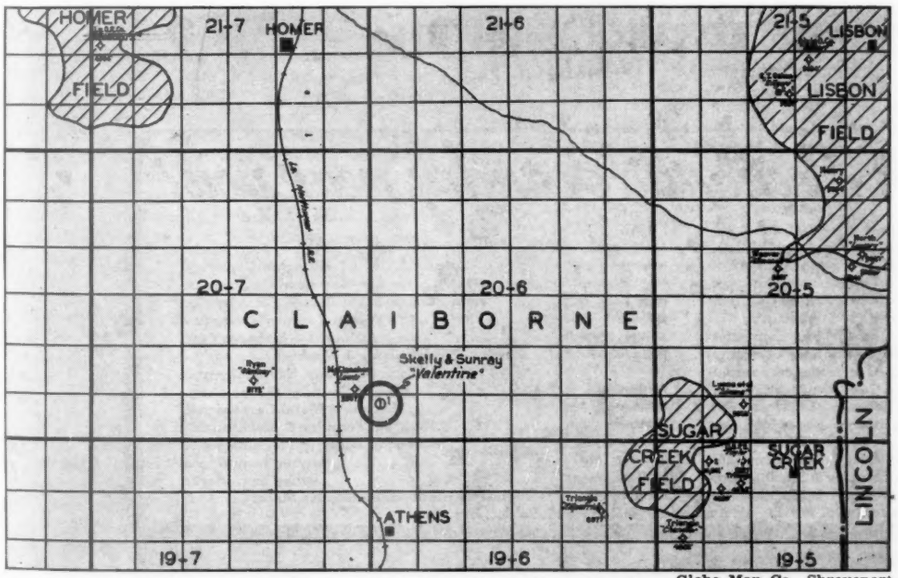
Oil wells: Nick Springs	1	*81	3,563
Urbana	1	*341	3,211
Dry holes: Wildcats	1		1,374
Total	3		8,153

*Barrels. †Million cu. ft.

Deep Lisbon Test

J. D. Caruthers 1 Simmons unit, Lisbon's current deep test likewise proved to be a gas-condensate producer in the first sand tested. The Cotton Valley section now producing is the deepest of several horizons in the Hosston and Cotton Valley which showed production possibilities. The test is bottomed at 9,016 ft., and 6⅝-in. casing was set at 8,940 ft. Perforations were shot at 8,766-8,806 ft. and the well came in making an estimated 1,750,000 cu. ft. of gas and 70 bbl. of condensate. A later and accurate gage shows a daily production rate of 90 bbl. of condensate and 1,400,000 cu. ft. of gas. Casing pressure is at 760 lb. and tubing pressure, which approximates separator pressure, is 330 lb.

The low producing rate is attributed to the fact that the section perforated, while extensive and clean, is of low permeability. Like the Athens test, the deep Lisbon well is not yet thoroughly cleaned and later gages will give a truer index of its performance. Operators plan to treat the well with acid in an effort to cut cement and improve its capacity. The well opens a new horizon to production, deeper than the Vaughn sand which produces gas and condensate in Lisbon Exploration 1 Vaughn to the northeast. After a few days' production, the well will probably be plugged back and tested in higher prospective sands.



Globe Map Co., Shreveport

The Athens field, newly discovered gas-condensate area in Claiborne Parish, Louisiana, was placed on initial production when Skelly Oil Co. and Sunray Oil Co. brought in 1 Valentine making 65.2 bbl. of condensate and 1,500,000 cu. ft. of gas. The well is not considered completed, since upper horizons will be tested. It is flowing through perforations in the basal section of a sand at 8,766-8,806 ft.

DAILY AVERAGE PRODUCTION

NORTH LOUISIANA

	Dec. 14	Dec. 7
Caddo light	5,250	5,960
Caddo heavy	2,065	2,340
Cotton Valley	13,600	13,320
Cross Lake	3,305	3,475
De Soto and Red River	940	1,020
Haynesville	2,620	2,630
Homer	2,685	2,685
Lisbon	2,875	3,050
Olla	8,280	7,900
Rodessa	17,250	16,915
Sligo	2,825	2,410
Sugar Creek	855	
Urania	2,280	2,325
Zwolle	1,395	1,395
North Louisiana	68,735	68,680
Rodessa Texas	14,300	12,285

SOUTH ARKANSAS

Atlanta	2,475	2,450
Buckner	1,790	2,035
Champagnolle	1,165	1,165
Dorcheat	1,300	1,325
El Dorado	1,625	1,635
Magnolia	19,640	19,500
Nick Springs	1,050	1,000
Rodessa	1,575	1,700
Schuler	16,625	16,600
Smackover light	1,560	1,560
Smackover heavy	13,600	13,600
Troy	1,125	1,120
Urbana	1,525	1,550
South Arkansas	68,715	68,705

Wilcox Play

Throughout Caldwell, Catahoula and La Salle parishes, the wildcatting campaign, aimed several hundred feet into the Wilcox sand, continues. In Caldwell Parish Gholson & Hodge report an odor of oil and gas in sand at 2,375-83 ft., 800 ft. below the top of the Wilcox. The wildcat, located in 35-12-3e, due north of Olla, is shut down at 3,015 ft. A show of asphaltic oil was also reported found at 2,945 ft. A second wildcat for the parish, V. V. Ryan 1 Louisiana Central, 16-12-4e, was staked during the past week.

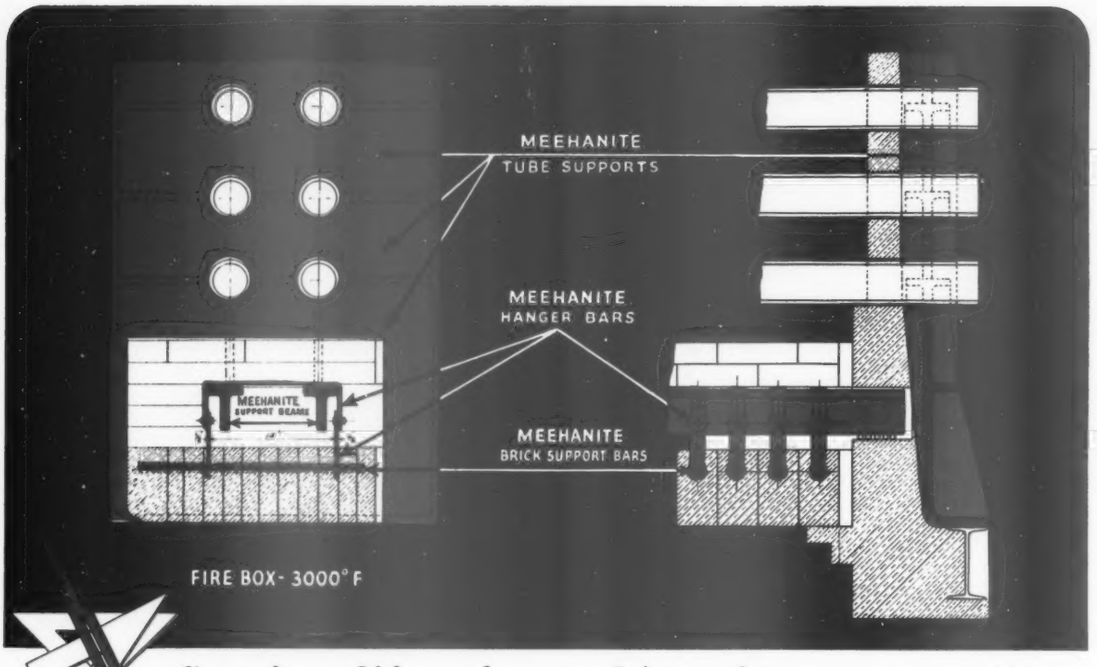
To the southeast in Catahoula Parish, Smith Brothers are moving material onto location for 1 Cernick, 29-11-8e.

In La Salle Parish, three wildcats are active, but shows have not been reported in either in the Wilcox. The third is approaching critical depth. Olla and Nebo were extended by field completions during the week, and a third field, Summerville, may be proven for oil production as a result of shows in the current test in that area. The Peterson Petroleum Corp. has encountered oil sands at 2,537-42 ft. and 3,046-52 ft. and has set 6⅝-in. casing at 3,192 ft., total depth at 3,197 ft. If successful in bringing in the 2 Tremont, the company will add another oil field to the lower Wilcox group producing in the parish. However, the discovery well of the Summerville field encountered oil sands also, but was completed as a gasser, hence, the presence of oil sand does not definitely prove new commercial production.

Red River Wildcat

Thornton & LaCroix 1 Prudential Life Insurance Co., 31-11-9, southeast of Bull Bayou in Red River Parish, last week pumped 18 bbl. of oil in 11 hours. The test is bottomed at 1,317 ft. with 5½-in. casing set at 1,195 ft. The 52-gravity oil is coming from a

(Continued on Page 72)



Service life of cracking furnace castings increased from FOUR months to ?

Design of a special protecting arch to prevent flame impingement on the tubes of a cracking furnace, owned by one of the large independent oil companies of Southern California, is shown in the drawing above. Prior to the application of heat resisting **Meehanite** castings to the parts indicated, service life of the saddle and hanger bars was but four months. **Meehanite** castings have been in service for more than twenty-five months—withstanding a constant temperature of 1600° F. without signs of deterioration.

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Orillia, Canada	E. Long, Ltd.
Philadelphia, Pa.	Florence Pipe Foundry & Machine Co., (R. D. Wood Company, Selling Agents)
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St. Paul, Minn.	Valley Iron Works
London, Eng.	The International Meehanite Metal Co., Ltd.

By
L. P. STOCKMAN

Wheeler Ridge Eocene Well Goes to Water; Will Deepen

LOS ANGELES, Calif., Dec. 16.—The California oil industry will wind up the current year in fairly good condition from a statistical standpoint although from a financial standpoint 1940 left much to be desired. Total stocks of crude and refined oil which aggregated 151,935,248 bbl. in Pacific Coast territory at the beginning of the year have been reduced to about 146,000,000 bbl. at the close of November and should show a small change during December. This means that room has been provided for about 5,000,000 bbl. in case conditions should necessitate an accumulation during the next few months. It is interesting to note that gasoline stocks have been reduced about 2,000,000 bbl. during 1940 although about 1,000,000 bbl. of this was offset by an increase in natural gasoline which built up during the year. Crude-oil stocks are being maintained at approximately the level at the beginning of the year but fuel-oil stocks have been reduced about 5,000,000 bbl. during the past 12 months. It is surprising in view of this favorable demand, which includes offshore shipments, that prices have remained at low levels. There is very little differential between the cost of the raw product and net returns from sales with the result that profits of integrated companies will not be as favorable as might be expected. The picture from the producers' standpoint is not much better due to the high cost of drilling and the fact that curtailment necessitates a substantial restriction in flow.

SUMMARY OF COMPLETIONS

	No.	Prod.	Footage
Oil wells: San Joaquin Valley	8	6,851	68,427
Dry hole: San Joaquin Valley	1	.....	13,150
Oil wells: Los Angeles Basin	3	997	11,284
Oil wells: Coastal district	5	2,143	23,183
Total	17	.....	116,044

One might think in view of the above data that there is no overproduction in California at the present time and it would be impossible to prove otherwise inasmuch as stocks are being reduced. For this reason it might not be amiss to call attention to the fact that the existing curtailment program is predicated on the assumption that any reduction effected in stocks during the summer months would be offset by an accumulation of stocks during the winter months when demand is lowest. It has been the endeavor of the Conservation Committee to stabilize crude-oil production throughout the year and thus eliminate high production during the summer and an abnormally low production during the winter. It has been found highly advantageous to maintain a flat production curve during the year in the interests of conservation and elimination of waste. Natural-gas consumption is highest during the winter period but this increased demand is taken care of by a resumption of production in dry gas fields. For several years it has been possible to make up any gas deficiency by opening up dry gas wells and this condition obviously works out very well.

Wheeler Ridge

Richfield Oil Corp.'s promising wildcat in the Wheeler Ridge field which picked up 64 ft. of good-looking Eocene oil sand at 10,934 ft. turned out to be a distinct disappointment this week when it was completed flowing 1,000 bbl. of salt water with only a bare trace of oil and gas. This well cored a few feet of gray sand in the bottom of the hole and this might be the source of the salt water. It is the present intention of the company to allow the well to produce for another few days before reentering the hole. If no change takes place for the good the company will resume drilling and carry the hole down to a second possible productive interval that was found in the company's initial wildcat in this district. The results shown by this well closely parallel the company's first wildcat although the present well found the upper zone barren whereas the initial test produced for about a week before going to water. Richfield's exploration work is predicated on the assumption that a new field will be discovered if it succeeds in securing commercial production due to the existence of a fault between this area and the old Wheeler Ridge field. The results of work by Richfield tend to indicate the probability that Standard Oil Co. will ultimately develop Eocene production in the Wheeler Ridge field with deeper drilling.

Elk Hills

The starting of a probable deep test in the Elk Hills field by Standard Oil Co. is a late development that might assume great importance in the not far distant future. It has been known that the Navy Department will sooner or later start a movement to condemn all acreage in the Elk Hills field as the initial step to create a naval reserve where production could be secured at a moment's notice when and if needed at some future date. A number of years ago, President Taft withdrew considerable acreage from entry in California in both Naval Reserves No. 1 and No. 2. With the establishment of these Naval Reserves all public lands within the confines of the two areas remained public lands and were not subject to entry by any citizen for either surface or subsurface rights. It so happened that the Elk Hills field is located inside Naval Reserve No. 2 and that there was considerable fee-owned acreage. The so-called Section 36 case in which the federal Government recovered possession of this school land by proving its title never passed to the State of California was the second step in a well-laid plan. The first step was the cancellation of several parcels held by Pan American Petroleum Co. which the federal prosecutor charged were obtained by fraud. This was the so-called Fall-Doheny Teapot Dome and Elk Hills litigation. Although Standard Oil Co. has made no announcement, it is believed quite likely that the starting of its new well in the Elk Hills field is to establish a value. This well, 42-31-S in 31-30-24, will undoubtedly be cored carefully through the upper zone and carried down for a deep test. All production to date in the Elk Hills field has come from the Pliocene and while one deep test has been drilled to date no Miocene production has been developed. The deep test in question was drilled by Standard Oil Co. in 31-30-25 and carried down to 8,404 ft. This well is located far out on the east flank of the structure and was not as favorably located as might be desired. Standard's present test is located east of the Hay section and should prove an interesting well. The Elk Hills field is separated into two parts. The west portion is known as the Hay area and the eastern part is designated as the Tupman area. The district has always been considered to be one large field but this has been conjectural because creation of the Naval Reserves prevented the drilling of wells in the area intervening between the two productive areas.

SAN JOAQUIN VALLEY COMPLETIONS

Coalinga Northeast Field

Standard 37-19-B fee 19-19s-16e
Flowed 506 bbl., 26.6-gravity, 0.5 per cent cut, 59,000 cu. ft. gas. 12/64-in. bean. Pressures 1,100/1,225 lb. Elev. 578 ft. T.D. 8,200 ft. 7-in. water string cemented 8,190 ft. 34 ft. 5-in. liner landed 8,198 ft. 60-mesh perf. open to production 8,188-98 ft. 8,178 ft. 2½-in. tubing. Completed in equivalent of Gatchell zone of Eocene age. Top green sand 8,120 ft., top oil sand 8,190 ft. Bottomed in oil sand. 56 days total elapsed drilling time. Fresno County.

Coalinga Southeast Field

Lytle, R. S., 66-7-F 7-20s-16e
Flowed 2,420 bbl., 31.3-gravity, 1 per cent cut, 1,560,000 cu. ft. gas. 27/64-in. bean. Pressures 1,150/1,375 lb. Elev. 807 ft. T.D. 8,015 ft. 8⅝-in. water string cemented 7,350 ft. 698 ft. 6⅝-in. liner landed 8,015 ft. 100-mesh perf. open to production 7,414-8,015 ft. 7,967 ft. 2½-in. tubing. Completed in Gatchell oil zone of Eocene age. Top Kreyenhagen with Schlumberger 6,212 ft., top green sand 7,354 ft., top main Gatchell oil zone 7,373 ft. Base Gatchell oil zone 8,003 ft. Bottomed in silt. 37 days total elapsed drilling time. Fresno County.

Fruitvale Field

Kelley, P. L., 2 Greeley 23-29s-27e
Pumped 20 bbl., 22.1-gravity, 15 per cent cut. Elev. 408 ft. T.D. 3,685 ft. 8⅝-in. water string cemented 3,117 ft. 620 ft. 6¾-in. liner landed 3,685 ft. and cemented through perf. 3,520 ft. Perf. open to production 3,530-3,685 ft. 3,400 ft. 2½-in. tubing. Deepened from 3,160 ft. Completed n Kern River series. Kern County.

Kettleman North Dome Field

K. N. D. A. 34-20-Q 20-22s-18e
Flowed 1,064 bbl., 38.4-gravity, 0.7 per cent cut. 2,559,000 cu. ft. gas. 128/64-in. bean. Pressures 250/750 lb. Elevation 1,208 ft. T.D. 7,602 ft. 6⅝-in. water string cemented 7,291 ft. 337 ft. 4¾-in. liner landed 7,595 ft. and cemented through perf. 7,420 ft., 7,490 ft. Perf. open to production 7,300-7,595 ft. 6,026 ft. 2½-in. tubing. Completed in Temblor. 45 days total elapsed drilling time. Kings County.

AVERAGE DAILY PRODUCTION
LEADING CALIFORNIA FIELDS

	Dec. 14	Dec. 7
Wilmington	83,125	82,150
Midway-Sunset	43,575	43,550
Long Beach	41,325	41,750
Kettleman North Dome	39,400	38,250
Ventura Avenue	34,225	33,500
Coalinga	31,450	31,825
Huntington	26,850	24,475
Santa Fe Springs	25,425	25,050
Dominguez	21,025	21,075
Santa Maria Valley	19,450	18,375
Montebello	17,100	17,250

Rio Bravo Field

Superior 1 Little 27-28s-25e
Flowed 1,436 bbl., 39.4-gravity, 0.2 per cent cut, 1,631,000 cu. ft. gas. 32/64-in. bean. Pressures 1,325/1,525 lb. Elev. 338 ft. T.D. 11,470 ft. 7⅝-in. water string cemented 11,304 ft. 188 ft. 5¾-in. liner landed 11,470 ft. 120-mesh perf. open to production 11,302-11,470 ft. 11,010 ft. 2½-in. tubing. Completed in Rio Bravo and Vedder zones. Top Rio Bravo zone 11,304 ft. Top productive Vedder zone 11,379 ft. Bottomed in Vedder oil zone. 38 days total elapsed drilling time. Kern County.

Union 72-28 Crites 28-28s-25e
Flowed 844 bbl., 39.1-gravity, 0.7 per cent cut, 1,051,000 cu. ft. gas. 18/64-in. bean. Pressures 1,675/2,005 lb. Elev. 335 ft. T.D. 11,480 ft. 5½-in. water string cemented 11,233 ft. 267 ft. 4-in. liner landed 11,473 ft. Perf. open to production 11,228-11,470 ft. 11,432 ft. 2-in. tubing. Completed in productive Rio Bravo and Vedder zones. Top Rio Bravo with Schlumberger 11,238 ft. Top Vedder 11,328 ft. Bottomed in Vedder oil sand. 57 days total elapsed drilling time. Kern County.

Tupman Field

Richfield 14-28-A Kern County Land 28-30s-25e
Flowed 139 bbl., 40.3-gravity, 20 per cent cut, 680,000 cu. ft. gas. 12/64-in. bean. Pressures 700/1,400 lb. Elevation 313 ft. T.D. 9,553 ft. P.B. 9,425 ft. 7-in. water string cemented 8,703 ft. 742 ft. 5¾-in. liner landed 9,420 ft. and cemented through perf. 9,097 ft. Perf. open to production 8,758-8,992, 9,099-9,273 ft., 4,325-9,420 ft. 9,382 ft. 2-in. and 2½-in. tubing. Completed in Stevens zone. Drilled by Bell & Loffland. 146 days total elapsed drilling time. Kern County.

Ten Section Field

Shell 85-30-A Kern County Land 30-30s-26e
T.D. 8,422 ft., P.B. 8,195 ft. Flowed 2,116 bbl., 35.1-gravity, 1.1 per cent cut, 3,613,000 cu. ft. gas. 48/64-in. bean. Pressures 165/2,000 lb. 4½-in. landed 8,195 ft. and cemented through perforations 7,985 ft. N point 7,470 ft., top productive Stevens oil sand 7,770 ft. Top gray sand 8,229 ft. Bottomed in gray sand but plugged back to bottom of Stevens oil sand. Kern County.

Wasco Field

Pacific Western 1 Meyer 7-27s-24e
T.D. 13,150 ft. 7-in. water string cemented 11,343 ft. Found water 13,135-50 ft. Squeezed 25 sacks cement through 39 ft. of 150-mesh perf. in 4¾-in. liner. Previously 250 sacks cement had been used in cementing through perf. 13,108 ft. Cleaned out to 13,130 ft. Formation test 13,130 ft. resulted in recovery of salt water. Plugged 13,035 ft., bridge 11,105 ft. Drilled through 7-in. casing 10,868 ft. Redrilled to 13,125 ft. and bottomed in shale. Landed 2,500 ft. 4¾-in. blank liner and cemented 13,125 ft. Drilled ahead to 13,135 ft. Tested wet showing salt water. Abandoned. Elev. 283 ft. This well which showed salt water definitely limits productive limits of field to northwest. Kern County.

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Rosecrans

Rainbow Oil Co. focused the attention of operators on the Rosecrans field of Los Angeles Basin early this week when its 21 Crawford got away from the crew and blew in flowing about 10,000,000 cu. ft. of gas and a small quantity of crude oil from a depth of 8,543 ft. The well continued to blow out of control for a period of 36 hours and then sanded up. It is at present flowing under control 165 bbl. of clean 40.9-gravity oil and 9,000,000 cu. ft. of gas per day. This well which is located in the area south of the original Rosecrans field proved quite a surprise as very few other adjacent wells showed such a high gas volume. Production is believed to be coming from a zone equivalent to the eighth Callender zone at Dominguez although it is possible that the bit may have tipped a ninth zone. Wells east of this well found the eighth Callender zone barren and for this reason the exact status of this new well remains undetermined. A number of wells located west of 21 Crawford and closer to the fault trap have shown excellent production from the O'Dea zone which is located above the eighth Callender zone. If the Crawford well is producing from the eighth zone those wells located to the west that are now producing from the O'Dea zone which is the equivalent of the seventh Callender zone will be able to secure large production upon being deepened. The gas produced by 21 Crawford contains 3 gal. of natural gasoline per 1,000 cu. ft. of gas which accounts in part for the high-gravity oil produced.

Coyote

Golden Bear Oil Co. has taken a lease on the 60-acre Arnold property in 14-3s-11w in the West Coyote field adjoining acreage leased several months ago by Wilshire Oil Co. west of Standard's Coyote tank farm. Wilshire Oil Co. has about 600 acres under lease and Texas Co. has leases on about 1,200 acres. It is quite probable that Wilshire and Texas will drill a series of core holes across the two blocks. Standard Oil Co. is apparently interested as it will participate in any development program if commercial production is secured due to the proximity of its tank farm which is owned in fee. Deep-zone development has quieted down in the East Coyote field of Orange County although Union Oil Co. should be ready to make a production test on 2 Toussau within another week. This well was carried down to 7,775 ft. but was subsequently plugged back to 7,305 ft. and a string of 7-in. casing cemented at 4,120 ft. with 604 sacks of cement. The crew is at present scraping the hole for a test of the Bartholomae zone at 6,500 ft.

Deep Wells

Union Oil Co. has reached a depth of 10,590 ft. in 79 Callender, a deep test in the west end of the Dominguez field, but has not yet found anything of importance below the present productive eighth Callender zone. In the Long Beach field, Union's deep test has only passed the 7,600-ft. level and still has another 1,500 ft. to go before reaching the productive zone that has been found at 10,000 ft. All wells finished in this 10,000-ft. zone to date have been rather small wells and operators interested in this field will watch the results of drilling on Union's Long Beach Community lease. In the Inglewood field of Los Angeles Basin, Standard Oil Co. is rotating and coring ahead in 3-1 Los Angeles Investment at 8,360 ft. and should pick up the Sentous sand in the near future. A core at 8,018-30 ft. was hard sandy shale of Miocene age.

LOS ANGELES BASIN COMPLETIONS

Huntington Beach Field

Signal O. & G. 12-A Bolsa 34-5s-11w
Flowed 505 bbl., 26.9-gravity, 1.3 per cent cut, 542,000 cu. ft. gas, 38/64-in. bean. Pressures with 23/64-in. bean 330/605 lb. Elev. 14 ft. T.D. 3,872 ft. 8⅝-in. water string cemented 2,830 ft. 1,064 ft. 6⅝-in. liner landed 3,872 ft. Perf. open to production 2,831-3,872 ft. 3,853 ft. 2½-in. tubing. Completed in Bolsa zone. 14 days total elapsed drilling time. Orange County.

Wilmington Field

Madison, Leslie, 2 Kern 32-4s-13w
Pumped 150 bbl., 14.6-gravity, 4 per cent cut. Elev. 38 ft. T.D. 3,706 ft. 8⅝-in. water string cemented 3,018 ft. 718 ft. 5¾-in. gravel-packed liner landed 3,717 ft. Perf. open to production 3,018-3,306 ft., 3,364-3,717 ft. 3,676 ft. 2½-in. tubing. Completed in Ranger zone. 13 days total elapsed drilling time. Los Angeles County.

Martin-Miller 13 Pet. Man. 32-4s-13w
Flowed 342 bbl., 16.2-gravity, 7 per cent cut, 20,000 cu. ft. gas, 20/64-in. bean. Elev. 41 ft. T.D. 3,706 ft. 8⅝-in. water string cemented 3,000 ft. 724 ft. 7-in. liner landed and cemented 3,706 ft. Perf. open to production at intervals. 3,669 ft. 3-in. tubing, packer 2,898 ft. Completed in Ranger zone. 14 days total elapsed drilling time. Los Angeles County.

COASTAL DISTRICT

Texas Co. has staked location for a second well to be drilled on the Bishop property which is located a little over 2 miles north of the Elwood field of Santa Barbara County and an early spud is scheduled. Earlier this year, Texas drilled 1-A Bishop but abandoned it as a duster at 4,350 ft. This well found the Vaqueros barren and the Sespe was found wet. The new well to be drilled will be designated as 2-A Bishop and will be drilled in 13-4n-29w. The decision to start a new well on the Bishop lease has resulted from several months of study and a checking of the log of the first well. The Santa Barbara area has also interested S. D. Coates of Long Beach who will attempt to develop commercial production on the Hollister ranch in the Castaic area. E. J. Miley prospected this district several years ago but sustained a severe financial loss when the wells he had drilled suddenly went to water. Mr. Miley's well produced a high gravity, straw-color distillate testing around 55°, A.P.I., from a relatively shallow depth.

The Los Angeles County Board of Supervisors is entertaining proposals to drill on the county's jail farm in the Castaic district of Los Angeles County in the general area where considerable interest has been manifested since completion of R. E. Havenstrite 1 Lincoln, discovery well on the Del Valle anticline several months ago. The county jail farm consists of 2,400 acres and according to the board Barnsdall Oil Co., Tide Water Associated Oil Co. and three other companies have signified their desires of obtaining a lease on the property. The Board of Supervisors has ordered preparation of a lease form but did not take any action with respect to awarding a lease to any operator. It is quite likely that the property will be awarded to the highest bidder at a public sale provided the terms of the lease are satisfactory. Discovery of productive fields in this area at Aliso Canyon, Newhall-Potrero and Del Valle will lead to additional wildcat drilling.

COASTAL DISTRICT COMPLETIONS

Rincon Field

C. C. M. O. 8-C Hobson 8-3n-24w
Pumped 125 bbl., 30-gravity, 0.6 per cent cut, 29,000 cu. ft. gas. Elev. 39 ft. T.D. 3,600 ft. 6⅝-in. oil string cemented 3,330 ft. 747 ft. 4¾-in. gravel-packed liner landed 3,599 ft. 2,850 ft. 2½-in. tubing. 6⅝-in. perf. 2,887-3,020 ft., 3,114-75 ft. 4¾-in. perf. 2,884-3,007 ft., 3,097-3,191 ft., 3,316-3,519 ft. Completed in Hobson oil zone. Ventura County.

Shiells Canyon Field

Field Gas Corp. 3-B Calumet 3-3n-19w
Pumped 140 bbl., 31.9-gravity, 3.2 per cent cut. Elev. 924 ft. T.D. 2,887 ft. 9-in. water string cemented 2,554 ft. 367 ft. 5¾-in. liner landed 2,886 ft. Perf. open to production 2,556-2,886 ft. 2,500 ft. 2½-in. tubing. Completed in Sespe. 40 days total elapsed drilling time. Ventura County.

Santa Barbara Mesa Field

Trans-Oceanic 6 Mdivani 28-4n-27w
Pumped 25 bbl., 14.5-gravity, 2 per cent cut. Elev. 100 ft. T.D. 1,548 ft. 8⅝-in. water string cemented 1,516 ft. 55 ft. 6⅝-in. liner landed 1,548 ft. Perf. open to production 1,516-48 ft. 1,500 ft. 2½-in. tubing. Completed in only productive zone in field. 21 days total elapsed drilling time. Santa Barbara County.

Ventura Avenue Field

Shell 36 Edison 21-3n-23w
Flowed 1,393 bbl., 30.7-gravity, 4.8 per cent cut, 896,000 cu. ft. gas. 127/64-in. bean. Pressures 150/1,250 lb. Elev. 155 ft. T.D. 9,508 ft. 7⅝-in. water string cemented 8,010 ft. 1,516 ft. 5½-in. liner landed 9,505 ft. Perf. open to production 8,010-8,204 ft., 8,249-8,412 ft., 8,456-8,585 ft., 8,602-9,103 ft., 9,146-9,316 ft., 9,349-9,430 ft., 9,471-9,505 ft. 9,286 ft. 2½-in. tubing. Completion in 57 zone. 79 days total elapsed drilling time. Ventura County.

Shell 127 Taylor 29-3n-23w
Flowed 460 bbl., 30.4-gravity, 9.6 per cent cut, 862,000 cu. ft. gas. 128/64-in. bean. Pressures 125/425 lb. Elev. 365 ft. T.D. 5,640 ft. 7⅝-in. water string cemented 5,200 ft. 424 ft. 5½-in. liner landed 5,637 ft. Perf. open to production 5,163-5,563 ft., 5,593-5,637 ft. Completed in upper zone on compressor. Ventura County.

Oklahoma Fields

(Continued from Page 59)

Oswego 2,260 ft., Mississippi lime 2,692 ft., drilling 2,745 ft.

Payne County

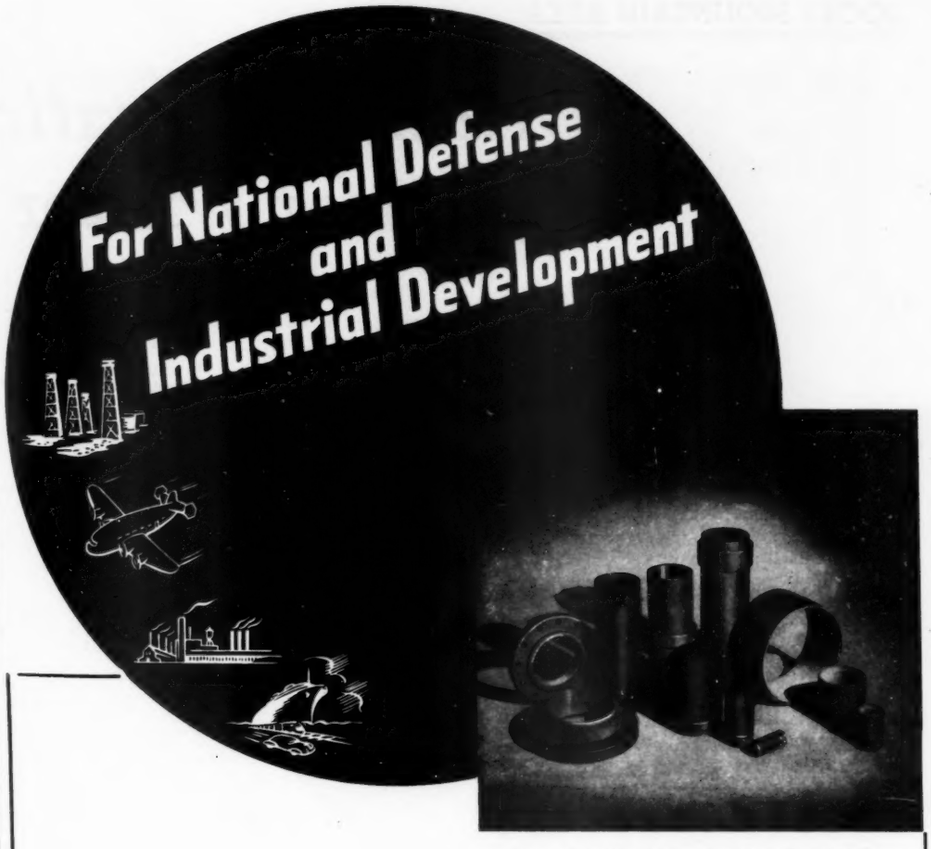
J. E. Crosbie 1 Moore ..... NE NE NW 29-19-2
Oswego 4,010-60 ft., show oil, Mississippi lime 4,418 ft., drilling 4,539 ft.

Roy Starr 1 State ..... C W½ SW SW 16-20-2
Oswego 4,000 ft., Prue 4,195 ft., Mississippi 4,614 ft., drilling 4,690 ft.

Seminole County

Alma Oil 1 Borden ..... NE SE NW 4-8-8
Woodford 3,965 ft., Hunton 3,993 ft., show oil, Sylvan 4,125 ft., Viola 4,206 ft., dolomite 4,255 ft., first Wilcox 4,273 ft., set 7-in. casing 4,238 ft., rigging up standard tools.

Weldon Hall 1-A Jackson ..... NE NE SE 14-7-7
Drilling 1,110 ft.



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Drilling Operations Slowing Down for Winter Months

By

T. R. INGRAM

DENVER, Colo., Dec. 16.—Bartson Oil Co. is moving in for a wildcat 2 miles north of the old Boulder field in Colorado. Sideman-White 1 Martinez, Huerfano County, was a bad hole and abandoned at 1,630 ft.

General Petroleum 37-22-P, outside well, southeastern side Cole Creek, pumped 215 bbl. a day from the Shannon sand. Ohio 18 Elizabeth Lamb, in Lance Creek, was completed for 418 bbl. in the Leo sand. Texas 1-I Government, La Barge field, flowed 120 bbl. in 24 hours from the second sand. Meridian Oil 1 Pat., Evanston district, was abandoned at 800 ft.

In Cut Bank, Montana, R. A. Kullberg 1 Tribal-192, an outpost well on the southwest, swabbed 240 bbl. the first 24 hours. British-American Oil Co. 13 Tribal swabbed 22 bbl., and A. R. Pardue 5 Tribal-171, made 130 bbl., swabbing.

A bill to quiet title on 1,480 acres of land in the eastern part of Lance Creek has been introduced in the Senate as a compromise between the Government and owners of placer claims. It will open considerable territory to development.

Many wells in the Rocky Mountain area are beginning to shut down for the winter, particularly wildcats in remote districts.

SUMMARY OF COMPLETIONS

	No.	Prod.*	Footage
Colorado			
Dry holes	1	.....	1,630
Wyoming			
Oil wells	3	753	11,138
Dry holes	1	.....	800
Total	4	.....	11,938
Montana			
Oil wells	3	392	8,697

*Barrels.

COLORADO

Boulder County

Barston Oil Co. is moving in machinery for a test 2 miles north of the old Boulder field. It will be drilled with cable tools to around 2,500 ft. First objective is expected at 2,000 ft. Lewis C. Rush, Denver attorney, is interested. Ohio Oil Co. drilled at Haystack, 2 miles southwest in 1924 in C NW 28-2n-70w, and was abandoned in the Morrison at 3,485 ft. A fault is believed to separate the two areas and several geologists have reported favorably on the new location.

Bartson Oil 1 Chenburg ..... SW SW SE 15-2n-70w
Moving in, first report.
J. A. Warren 3 Maxwell ..... NW NE NW 24-1n-71w
T.D. 975 ft., cleaning out at 700 ft.

Fremont County

U-Tex Oil 1 Hassler ..... NE 28-20s-69w
Drilling 2,850 ft.

Huerfano County

L. E. Sideman-White 1 Martinez, C SW NE 33-26s-67w, La Veta district, was abandoned at 1,630 ft. on account of lost hole.

La Plata County

Nick Spatter 1-X Bryce ..... SW SW 31-33n-9w
Cemented off caves at 4,390 ft., building heavier rig to test Pennsylvanian, will move light rig to new location to go to gas sands at 1,250 ft. and 2,150 ft.

Larimer County

E. P. Gallup 1 Hanson ..... C SE NW 36-10n-71w
T.D. 230 ft. (correct depth), trying to shut off water.

Las Animas County

Barney Oil Corp. 1 Dutto-Marchisio ..... NW NW 32-33n-62w
Drilling 350 ft.

Logan County

West Plains 1 Sheldon ..... SE NW SW 3-10n-55w
Drilling 3,271 ft. in black shale.

Park County

South Park Oil 1 Lamar ..... NE NE SE 34-11s-75w
Drilling 7,624 ft. in sand, Colorado Interstate Gas Co. preparing to make volume and pressure test of gas.

Rio Blanco County

Texas-California 5 Unit ..... NW NE NE 34-3n-94w
Drilling 2,755 ft.
Buford Oil 1 Government ..... SW SW 16-1n-91w
T.D. 4,387 ft., recemented 6⅝-in. at 4,206 ft.

Routt County

Mid-Colorado Pet. 1 Omholt ..... NE NE SE 29-4n-87w
T.D. 3,160 ft., 2,600 ft. water in hole, preparing to test oil show at 3,135 ft.

WYOMING

Big Horn County

McDonald & Curtis 1 Orchard ..... SE NW 24-51n-93w
Drilling 1,125 ft.

Carbon County

Robinson & O'Donnell 1 State SW SW NE 16-26n-89w
Spudded.
Sinclair-Wyoming 2-A Mahoney C SW NE 34-26n-88w
T.D. 4,507 ft., cleaning out at 4,497 ft. to drill deeper, top of Tensleep 4,287 ft.
Sinclair-Wyoming 18 Wertz ..... SE SE NW 7-26n-89w
Ready to spud.
Sinclair-Wyoming 17 Wertz ..... NE NE NW 7-26n-89w
Spudded.
Sinclair-Wyoming 16-A Wertz ..... SW SW SW 6-26n-89w
Drilling 5,459 ft.
Ohio 2 Lundy ..... SE NE NW 34-20n-78w
Drilling 3,992 ft.
Sinclair-Wyoming 15-A Wertz ..... SW SW NE 7-26n-89w
Drilling 3,924 ft.

Natrona County

General Petroleum Corp. 37-22-P, NW SE SW 22-35n-77w, Cole Creek, an outside well on the southeast side of the field, pumped 215 bbl. a day initial at 4,576 ft., total depth, from the Shannon sand, top at 4,538 ft., and first saturation at 4,545 ft. Location is ¼ mile east of No. 7-22-P, which made 130 bbl. initial.

Casper Creek Oil Co. 1 State SW SW NW 36-36n-81w
Drilling 2,010 ft. in Carlisle shale.
Royal Oil Corp. 1 Midert ..... SW SW SW 26-35n-80w
T.D. 1,555 ft., running 8-in. to 1,400 ft.

Niobrara County

Lance Creek had one completion in Ohio Oil Co. 18 Elizabeth Lamb-Acct. 2, SE SW NE 5-35n-65w, inside location, which flowed 42 bbl. an hour in a 12-hour test and then 418 bbl. in 24 hours from the Leo at 5,485 ft., total depth. The 7-in. at 5,375 ft. was perforated with 72 holes at 5,245-5,320 ft. Testing is still in progress.

Drilling operations are now down to three wells and these are all near-completions. No new operations are expected until after January 1, 1941.

Minnelusa Oil Corp. 4 Joss ..... SW NE SW 6-35n-65w
Drilling 4,560 ft.
Continental 22 Tom Bell ..... SE NW NW 34-36n-65w
T.D. 5,315 ft., cemented 7-in. at 5,279 ft., saturated Leo at 5,281-5,315 ft.
Continental 23 Tom Bell ..... SE NW SW 34-36n-65w
T.D. 5,355 ft., cemented 7-in. at 5,288 ft., acidizing.

Park County

Continental 2 Northern Pacific NE NW NW 23-58n-98w
Coring in lime at 3,608 ft.
Resolute 2 State ..... SW SW 16-57n-101w
T.D. 10,121 ft., redrilling to Frontier.

Platte County

Dividend O. & R., Inc., 1 Johnson ..... CSL NW SW 17-24n-66w
Drilling 3,940 ft. in gray lime.

Sublette County

Texas Co. 1-I Government, SW NW SW 27-27n-113w, La Barge district, was completed at 1,077 ft., total depth, and flowed 60 bbl. in 13 hours and then made 120 bbl. in 24 hours from the second sand.

Klumpe Syndicate 1 ..... NE SW NE 28-27n-113w
Spudded to 80 ft., set casing and S.D.
Texas 1-C Government ..... SW NW NW 24-27n-113w
Location.
Texas 1-J Government ..... NW SW SW 27-27n-114w
Location.
Marvel Oil 6 Government ..... CEL SE SE 28-27n-113w
Rigging up.
North La Barge Oil 6 Govt. CNL SE NE 28-27n-113w
Drilling 960 ft.

Sweetwater County

Rocky Mountain Drlg. 1 State SW SW SW 36-20n-104w
Rigging up rotary.
Sinclair-Wyoming 78 ..... SW SW NW 11-26n-90w
Drilling 4,427 ft.
Sinclair-Wyoming 97-A ..... NW NW SW 11-26n-90w
T.D. 505 ft., reaming.
Gus Pongratz et al 1 Clark ..... NW NE 22-19n-104w
S.D. 5,005 ft., moving in heavier equipment, top red beds 4,955 ft.

Uinta County

Meridian Oil Co. 1 Pat., NW NW NE 26-13n-119w, Evanston district, was abandoned at 800 ft.

MONTANA

Big Horn County

Massey Oil & Gas 1 Government ..SE SW SE 11-2s-31e
Drilling 2,008 ft. in Dakota.

Blaine County

Cherry Ridge Synd. 1 Harbolt ..NW NW SW 1-35n-20e
Landed 10-in. at 1,220 ft., for formation shutoff.

Carbon County

Miracle Oil Co. 2 Government ..CWL NE SE 3-6s-23e
T.D. 2,338 ft., reaming to set casing on bottom.

Glacier County

Cut Bank had three completions.

R. A. Kullberg 1 Tribal-192, C NE NW 19-32n-5w, an outpost well in the extreme southwest side of the field, a ¼-mile extension, swabbed 240 bbl. the first 24 hours at 2,842 ft., total depth, from the Cut Bank sand at 2,785-2,840 ft. Main pay was at 2,833-40 ft., oil rising 2,000 ft. in the hole.

British American Oil Co. 13 Tribal, C NE SW 34-35n-6w, swabbed 22 bbl. the first 24 hours at 2,930 ft., total depth. It was then shot with a total of 110 qt. at 2,900-16 ft. without any increase. The Cut Bank was at 2,853-2,916 ft. and the main pay at 2,908-16 ft.

A. R. Pardue 5 Tribal-171, SW SE SW 7-32n-5w, swabbed 130 bbl. the first 24 hours at 2,925 ft., total depth, from the Cut Bank at 2,892-2,918 ft. The main pay was at 2,907-18 ft.

Glacier Prod. Co. 3 Lookhoff ..NW NE NE 33-33n-5w
Spudded.
Texas 8 State ..... C NE SW 16-32n-5w
Cemented 10¾-in. at 563 ft., top Colorado 530 ft.
Texas 6 fee ..... 660 ft. N of S¼ cor. 15-35n-6w
Drilling 1,415 ft., top Colorado 530 ft., 10¾-in. at 333 ft.
Consolidated Gas 1 Frary-Tribal NW NW SE 19-32n-5w
Rig.

Toole County

Twinfields Oil 3 Thompson ..... NW NW SE 28-35n-3w
S.D. 1,745 ft., contact dry at 1,713 ft., show oil at 1,736-42 ft.
Kevin Oil 4 Leach ..... C SE NE 31-35n-3w
T.D. 1,669 ft., cemented 7-in.
R. G. Parrant 1 Holbrook ..... C NW NE 2-36n-3w
Drilling 1,530 ft.
Montana Gas Corp. 1-X Nelson CNL SE NE 12-35n-1e
S.D. 2,115 ft.
A. A. Welch 2 Lerum ..... SE SW NW 25-36n-2w
T.D. 1,658 ft., contact at 1,641-58 ft.
C. L. Mills 2 Government ..... SE NE SE 8-35n-2w
Drilling 1,639 ft., show oil 1,630-36 ft.

NORTHWEST NEW MEXICO

Bernalillo County

David H. Boyd 1 Wright 11-10n-5e
Building rig, Tijeras area.

McKinley County

Ambrosia Investors Co., Inc., 1 Govt. SE SE 11-14n-10w
T.D. 1,600 ft., underreaming 8-in. from 1,362 ft. to bottom.

Rio Arriba County

E. B. McKenna 1 Government-Rath ..NW 29-26n-2e
Drilling 300 ft.

San Juan County

Red Cactus Oil 1 Tribal ..... SE cor. 35-29n-18w
Drilling 950 ft.

San Miguel County

Southwest Drilling, Inc., 1 Conchas NW NE 34-17n-21e
Recementing 8¼-in. at 2,635 ft.

Torrance County

J. P. Stewart 1 Laman ..... C NW NE 3-3n-12e
Drilling 600 ft.

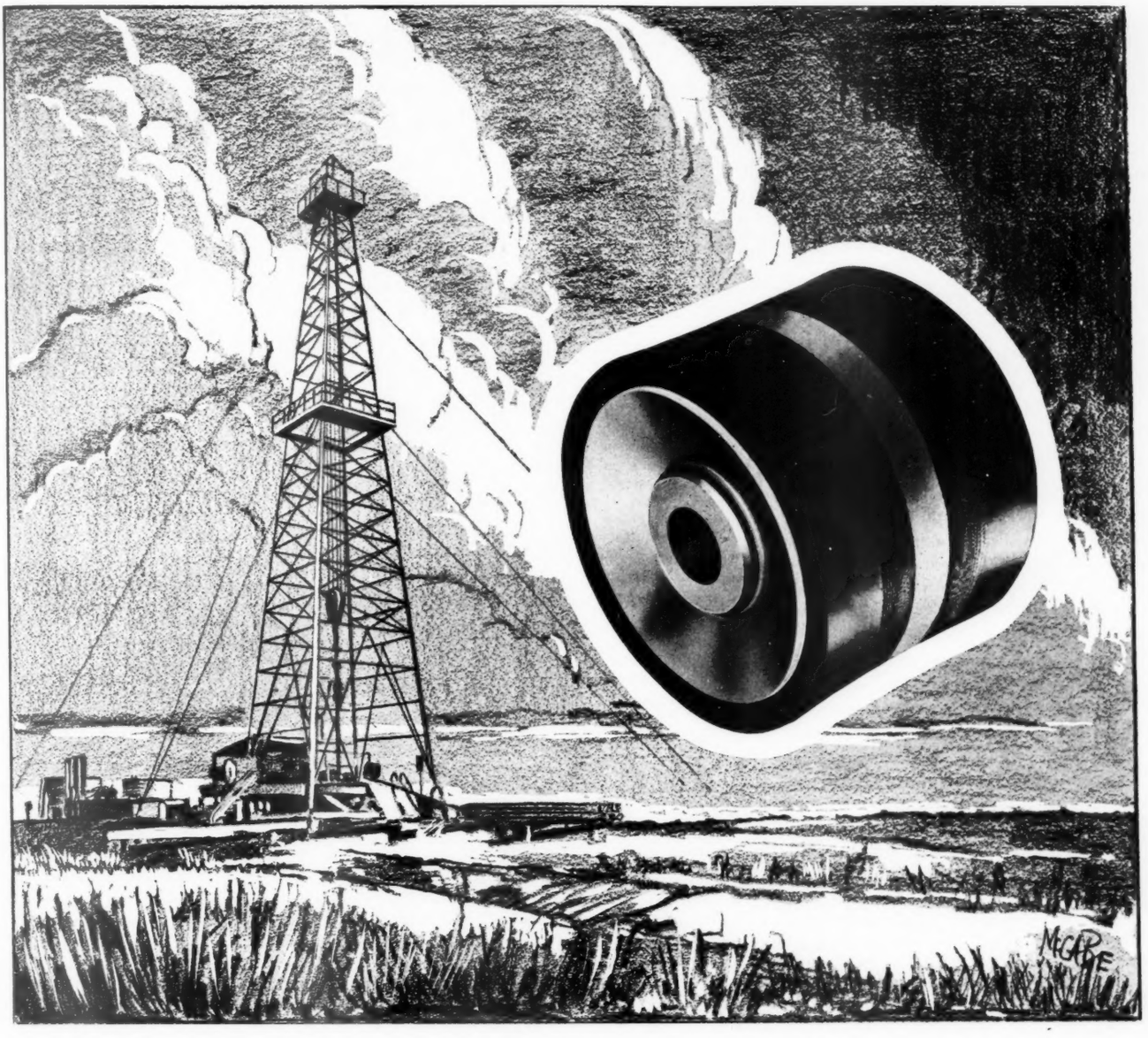
UTAH

Box Elder County

Northern Oil 1 ..... NE SW 17-13n-4w
Resumed at 386 ft. and drilling ahead at 475 ft.

Summit County

Longwell Pet. Co. 1 ..... SE SW SE 35-3n-5e
S.D. 3,525 ft. for drilling line after setting 4¾-in. at 3,492 ft.



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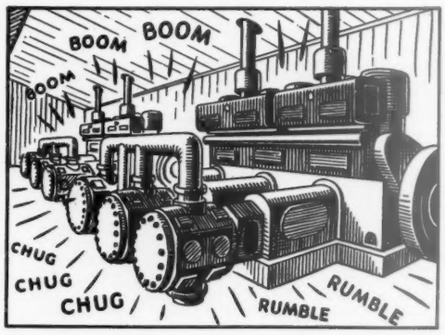

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TEXAS GULF COAST

Lavaca County Wildcat May Open New Wilcox Pool

By NEIL WILLIAMS

HOUSTON, Tex., Dec. 16.—Interest in the Texas Gulf Coast district centered on the Wilcox trend as casing was being moved in to test M. McMurray et al 1 Allen, located 10 miles east of Halletsville in Lavaca County. The well is bottomed at 8,523 ft., and casing is expected to be cemented on bottom preparatory to testing two sand sections which were logged by an electrical survey. The survey showed the following results: Sand showing gas 8,413-23 ft.; broken sand and shale showing gas at 8,425-33 ft.; sand showing gas at 8,463-68 ft., and sand with a possible oil show at 8,492-8,506 ft. Salt-water sand was logged at 8,511-23 ft. Important geological markers were reported as follows: Sparta, 6,935-66 ft.; Weches, 7,235-65 ft.; probable Queen City, 7,605 ft., and the first Wilcox sand at 8,413 ft.

The completion of this well as a commercial producer would open the first production in the county, and the third Wilcox sand field to be opened in the upper Texas Gulf Coast sector during the year. The well is located in the M. Muldoon Survey, and is on strike with the Thomaston field in De Witt County, about 35 miles to the southwest and with the Sheridan field, Colorado County, approximately 15 miles to the northeast. The structure was found by geophysical methods by the Shell Oil Co., Inc., which controls approximately 12,000 acres in the area.

Locations for two more Wilcox tests were announced. In southeastern Grimes County R. A. Irwin and A. G. Muench staked location for 1 Schoenfeld in the R. O. Lusk Survey on a farmout lease from Standard Oil Co. of Texas. East of the San Felipe dome, Waller County, John G. Mayo et al are reported to have staked location for an 8,000-ft. test located on the P. H. Donigan lease in the William Cooper Survey.

SUMMARY OF COMPLETIONS

Texas Gulf Coast

	No.	Prod.	Footage
Oil wells: Lolita	5	1,347	29,711
West Ranch	2	1,268	11,559
Withers	4	405	21,682
Other fields	7	2,591	46,335
Dry holes: Fields	3		18,317
Wildcat	1		5,865
Total	22		133,460

Red Fish Reef Field

The newly opened Red Fish Reef field, offshore from Chambers County in Galveston Bay, continues to loom as a major discovery as preparations were being made by Humble Oil to test 7-A-264 State, 1 mile south of the discovery well. The well is bottomed at 9,710 ft., and 7-in. casing was cemented at 9,702 ft. The Frio was topped at 8,731 ft., and the following showings were logged by an electrical survey, and confirmed by side-wall cores. Gas sand 9,454-38 ft.; sand with an oil odor 9,103-9,218 ft., and sand with an oil odor 8,746-8,884 ft. The same company's 3-A-248 State, which extended the field and opened the first crude production the previous week, flowed 156 bbl. of 35.6-gravity oil per day through a ⅛-in. choke. Tubing pressure was 1,725 lb.

Jackson County Activity

Three more producers were added to the newly opened 5,200-ft. pay in the Lolita field, Jackson County, as drilling operations in the field continue to increase. Barnsdall Oil Co. 5 Lazarus and Magnolia 6 and 7 Mitchell were completed for average producers in the 5,200-ft. pay, while additional development was planned for the Lolita townsite.

In the same county and located as a northwest offset to the discovery well of the West Ganado field, Pure Oil Co. 1 W. B. Fowler was abandoned at a total depth of 6,177 ft., with only slight showings reported at intervals from 4,718-65 ft. Interest in the county is centered on Humble 1 Egg, about 6 miles northeast of La Ward which is coring in shale below 5,615 ft. Sand with an oil show was cored at 5,276-80 ft., and electrical survey is reported to have been made, but details were not available.

A southeast extension to the Rowan field, Brazoria County, was indicated as Stanolind 1 Burgess, topped oil sand at 8,528 ft., and the well is being completed after 7-in. casing was cemented at 8,548 ft. The well is located in the Stephen F. Austin Survey, about 1,600 ft. southeast of the company's 1 Hodnett.

New Sand at La Belle

Low-gravity oil from a new sand was opened in the La Belle field by the completion of Sun 8 Broussard & Hebert which flowed 249 bbl. per day through a ¼-in. choke. Tubing pressure was 225 lb., and gravity of the oil tested 28.4°. The well was drilled to a total depth of 7,450 ft., and was completed through perforated casing at 6,527-46 ft. Location was made for 9 Broussard & Hebert, 1,000 ft. southeast of the completed well. La Belle was originally established as a gas-distillate structure and later received its first crude production with the completion of Sun 7 Broussard & Hebert, completed in sand at 7,264-71 ft.

In the Chocolate Bayou field, Brazoria County, and located about 1 mile west of the discovery well, Phillips Petroleum Co. was preparing to test 1 Houston Farm Development Co. The well is bottomed at 10,006 ft., and several possible sand sections logged by an electrical survey above 9,900 ft., will be tested through perforated casing.

Christian-Carpenter Drilling Co. 1-A Backen, a south offset to the discovery well of the Ogburn field, Harris County, is testing through perforated casing at 6,448-51 ft., and is reported to be showing wash water and oil while cleaning out. The well has tested intervals from 6,900-7,100 ft., and gas, distillate and salt water was recovered.

Gas Reserves Acquired

Pan American Production Co., Houston, Tex., purchased 1,770 acres of land on the southeast side of the Dickinson field, Galveston County, for a reported consideration of approximately $200,000 cash plus an override. The acreage was purchased from Pure Oil Co., and Texas Gulf Producing Co., and included three gas-distillate producers and a fourth well which is being completed. The company agreed to drill four wells. A 270-acre lease out of the Fream 400-acre tract was also purchased from Humble Oil & Refining Co., including four gas and distillate producers. The purchase was made to insure a natural-gas reserve for the company's refinery at Texas City.

TEXAS GULF COAST COMPLETIONS

Brazoria County

Hastings field: Hastings Oil Co. 2 Alexander, 635 bbl., ¼-in. choke, top sand 6,082 ft., T.D. 6,122 ft.
Old Ocean field: Stanolind 1 Bernard River Land Dev. Co., 491 bbl., ¼-in. choke, perf. casing 10,132-42 ft., T.D. 11,031 ft.
Red Fish Reef field: Humble 3-A-248 State, 156 bbl., ⅛-in. choke, perf. casing 10,327-43 ft., T.D. 10,419 ft.

Fayette County

Wildcat: O. C. Garvey 1 Meyer, top Wilcox 5,320 ft., dry, T.D. 5,685 ft.

Jackson County

Lolita field: Barnsdall 5 Lazarus, 130 bbl., 7/64-in. choke, perf. casing 5,924-27 ft., T.D. 5,931 ft.
Humble 3-B L. Ranch, 600 bbl., ¼-in. choke, sand 5,923-32 ft., T.D.
Magnolia 6 Mitchell, 270 bbl., 11/64-in. choke, sand 5,277-83 ft., T.D.
Magnolia 7 Mitchell, 187 bbl., 9/64-in. choke, sand 5,272-83 ft., T.D.
Wellington Oil Co. 1-A L. Ranch, 160 bbl., ⅛-in. choke, perf. casing 5,946-50 ft., T.D. 7,282 ft.
West Ganado field: Pure 1 W. B. Fowler, dry, T.D. 6,177 ft.
West Ranch field: Magnolia 5 Turner, 578 bbl., ¼-in. choke, perf. casing 5,761-67 ft., T.D. 5,768 ft.
W. R. R. Oil Co. 5 State, 690 bbl., ¼-in. choke, perf. casing 5,732-44 ft., T.D. 5,782 ft.

Jefferson County

La Belle field: Sun 8 Broussard-Hebert, 249 bbl., ¼-in. choke, T.D. 7,450 ft.

Clam Lake field: Shell 7 McFaddin, dry, T.D. 6,528 ft.
Fannett field: Gulf 3-E Marrs McLean, 819 bbl., ¼-in. choke, sand 8,335-45 ft., T.D.

Liberty County

Hull field: Guinn Crude Oil Co. 18 Abel, 36 bbl., pumping, top sand 724 ft., T.D. 764 ft.
Ganar Oil Co. 13 Harrison, 205 bbl., ¼-in. choke, top sand 1,985 ft., T.D. 2,204 ft.

Wharton County

Withers field: F. W. Michaux 1 Larson, dry, T.D. 5,612 ft.
Pan American 5 Halamicek, 50 bbl., 5/64-in. choke, top sand 5,536 ft., T.D. 5,546 ft.
Texas 66-B Pierce, 110 bbl., ⅛-in. choke, top sand 5,306 ft., T.D. 5,378 ft.
Texas 85-C Pierce, 114 bbl., ⅛-in. choke, top sand 5,353 ft., T.D. 5,379 ft.
Texas 86-C Pierce, 131 bbl., ⅛-in. choke, top sand 5,364 ft., T.D. 5,379 ft.

Permian Basin, Panhandle

(Continued from Page 54)

to a total depth of 6,274 ft. The test was plugged back and tested at various zones during the past 2 years. All of these failed to make commercial production. It was located in Section 212, Block 43, H.&T.C. Survey.

PANHANDLE COMPLETIONS

Carson County

Skellytown field: Magnolia 93 fee 244, 195 bbl., pumping, 3,090-3,128 ft.

Gray County

Pampa field: S. & M. Oil 9 Worley, 117 bbl., pumping, 3,225-3,285 ft.
Sinclair Prairie 3 Worley, 182 bbl., pumping, 3,045-3,136 ft.
Northern Natural Gas 1 Hodges-Heap, 2,100,000 cu. ft., 2,735-2,815 ft.

Hutchinson County

Stinnett field: J. M. Huber 2 Riley, 9,100,000 cu. ft., 3,005-3,155 ft.
Phillips 27 Perkins, 266 bbl., pumping, 2,967-3,030 ft.
Gulf 9-B Whittenburg, 119 bbl., pumping, 2,900-3,026 ft.
Borger field: Shell 4-B Harvey Sisters, 340 bbl., pumping, 3,008-63 ft.
Cree & Hoover 8 Haile "B", 130 bbl., pumping, 2,-986-3,040 ft.
Phillips 11 Jordan, 165 bbl., pumping, 2,920-3,117 ft.

Ochiltree County

Wildcat: James R. Macon 1 Norris, Sec. 212, Blk. 43, H.&T.C. Sur., dry at 6,274 ft.

Wheeler County

Shamrock field: Gramp Oil 1 Sammons "B", dry at 2,-265 ft.

SOUTHEAST NEW MEXICO

HOBBS, N. M., Dec. 16.—Chaves County continued for another week to lead the district in activity as another wildcat test was staked to bring the total to five for the county. In Eddy County the official completion was registered for the shallow gas discovery by Wills and Abell on the Hale tract.

Completions in the district totaled nine, there being six new oil wells in Lea County and one new oil well, a gas discovery and a wildcat failure for Eddy County. Locations were eight in all, one in Chaves County, three in Eddy County and in Lea County.

The new Chaves County wildcat is R. I. Wilson 1 L. B. Brown, located in NW SW 29-11-23. It is a projected 3,000-ft. test and is about 8 miles southwest of Roswell.

Official completion was registered for Wills-Abell 1 Hale, SW SE SW 12-20-30, about 5 miles west and slightly north of the Wills field discovered last year in the center of 15-20-31. The new discovery gaged 5,000,000 cu. ft. of sweet gas daily through open tubing with a shut-in pressure of 650 lb. The pay was logged from 1,540-53 ft., plugged back from 1,848 ft. and treated with 500 gal. of acid.

SOUTHEAST NEW MEXICO COMPLETIONS

Eddy County

Wildcat discovery: Wills-Abell 1 Hale, SW SE SW 12-20-30, 5,000,000 cu. ft. sweet gas through open tubing, 500 gal. acid from 1,540-53 ft., P.B. from 1,848 ft.
Wildcat: Turner-DeVito 1 DeVito, SE SW SE 12-23-25, dry at 1,758 ft., sulfur water.
Artesia field: Sam Sanders 8 Berry, SW NE 24-17-27, 3 bbl., open tubing, 45-qt. shot, 450-76 ft.

Lea County

Lynn field: Republic 2 Davis, SE SE SW 34-23-36, 100 bbl., ¾-in. choke, naturally, 3,568-3,607 ft.
Mattix field: Olsen Oil 2-A Blinebry, NW NW 30-23-37, 25 bbl., 14/64-in. choke, 180-qt. shot, 3,542-3,616 ft.
Trinity Drilling Co. 3-B Mattix, SW SE 10-24-37, 96 bbl., ¾-in. choke, 590-qt. shot, 3,493-3,537 ft.
Eaves field: Krupp-Flaherty 1-C Moberly, NW SE 21-26-37, 840 bbl., ¾-in. choke, 280-qt. shot, 3,170-3,254 ft.
Maljamar field: Cockburn 27-B Baish, SW SW 27-17-32, 489 bbl., open tubing, 364-qt. shot, 3,814-4,002 ft.
Carper Drilling Co. 4-N Simon, SW NW 29-17-32, 130 bbl., open tubing, 60-qt. shot, 3,740-79 ft.

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Kanawha Field Extended by Ravenswood Prospect

By STAFF CORRESPONDENT

PITTSBURGH, Pa., Dec. 16.—In Ravenswood district, Jackson County, W. Va., the wildcat of the Columbian Carbon Co. on the P. F. Riggs farm is drilling through the Oriskany sand and a commercial gas well is indicated. The Oriskany sand was topped at 4,936 ft. with a volume of gas gaging about 1,000,000 cu. ft. At the present depth of 4,989 ft. or 53 ft. in the sand the volume has decreased to about 310,000 cu. ft. which normally is due to freezing at the sand. The Corniferous lime section is 109 ft. thick at this location and with a surface elevation of 634.4 ft., it places the Oriskany subsea 4,301.6 ft. It is located about ½ mile south of Odaville and 3 miles from the nearest Oriskany test.

During the past week in the lower eastern fields 29 operations were completed of which 22 were gas wells, 5 dry holes and 2 oil producers with a daily initial of only 4 bbls.

SUMMARY OF COMPLETIONS

Southwest Pennsylvania

	No.	Prod.	Footage
Gas wells	7	†0.7	18,165
Dry holes	2	.....	7,393
Total	9	.....	25,558

West Virginia

Gas wells: Oriskany	3	†8.3	14,909
Other	12	†3.3	25,941
Oil wells	2	*4	3,253
Dry holes	3	.....	5,074
Total	20	.....	49,177

*Barrels. †Million cu. ft.

SOUTHWEST PENNSYLVANIA

On Chestnut Ridge in South Union Township, Fayette County, Pa., Peoples Natural Gas Co. is drilling 3 Piedmont Coal Co. at 6,034 ft. and have rigged up for the No. 4. Here, New Penn Development Co., William E. Snee et al are drilling 3 Summit Hotel at 2,787 ft. In North Union Township, Wasson and others have been delayed by caving in the Marcellus in 2 J. H. Sorg and have cemented back to the Tully lime. Drilling will resume this week.

Armstrong County

Bethel Township: T. W. Phillips 1 Mrs. H. E. Gilchrist, 26,000 cu. ft. gas, 100-foot sand and Tiona, T.D. 3,558 ft.
Burrell Township: Equitable 1 Mrs. George Cravener, 211,000 cu. ft gas, Bradford sand, T.D. 3,460 ft.
Kiskiminitas Township: Chestnut Ridge 3 E. J. Shirey, 220,000 cu. ft. gas, Murraysville sand, T.D. 1,600 ft.

Clarion County

Piney Township: Frank Shreffler 8 Clarion County Home, 50,000 cu. ft. gas, Speechley sand, T.D. 1,100 ft.
Red Bank Township: Mayport Clay Co. 1 Samuel Wyncoop, 38,000 cu. ft. gas, Bradford sand, T.D. 2,814 ft.

Indiana County

Center Township: T. W. Phillips 1 W. H. George, dry, through Bradford sand, T.D. 3,514 ft.
Washington Township: T. W. Phillips 1 Mary J. Fairman, 140,000 cu. ft. gas, Thirty-foot sand, T.D. 1,731 ft.

Westmoreland County

Bell Township: Peoples 1 J. A. Kuhns, 26,000 cu. ft. gas, Bradford sand, T.D. 3,902 ft.
Washington Township: Peoples 1 J. M. Hill, dry, T.D. 3,879 ft.
ft.

WEST VIRGINIA

In Kanawha County, the important test of the Columbian Carbon Co. deepening the former Oriskany well on the John Price farm in Poca district topped the Clinton sand at 6,608 ft. and is drilling at 6,618 ft. and so far void of any showing. On the Copenhaver Heirs in this district, this company is shut down with a hole full of water at 5,668½ ft. where casing will be run. The Newburg, the source of the water, was topped at 5,608 ft.

In Harrison County, the deep rotary test of Hope Natural Gas Co. on the C. S. Gribble farm in Grant district, is drilling at 9,197 ft. and still in dolomitic lime.

In Ravenswood district, Jackson County, the two wildcats of the Columbian Carbon Co. are progressing with No. 1 F. F. Starcher at 2,305 ft. and No. 1 F. L. Roliff at 1,823 ft.

Calhoun County

Center district: Hope 8,518 Pruda E. Smith, 166,800 cu. ft. gas before shot; salt sand 1,370-90 ft., gas 1,381-82 ft.; Big Injun sand 1,730-92 ft., gas 1,753-72 ft., T.D. 1,833 ft.
Sherman district: Hope 8,521 H. L. Robinson, 1,400,000 cu. ft. gas, Third Salt sand 1,507-80 ft., gas 1,574-80 ft., 300,000 cu. ft. cased off, Maxton sand 1,634-1,730 ft., show oil 1,703-09 ft., Big lime 1,773 ft., T.D. 1,809 ft.

Gilmer County

Center district: Burge & Lowther 1 Scott Vanhorn, 50,000 cu. ft. gas; Big lime 1,732-92 ft., Big Injun 1,792-1,900 ft., gas 1,860-87 ft., T.D. 1,944 ft.
DeKalk district: White Pine O. & G. Co. 1 Mosy Ayers, 70,000 cu. ft. gas; ⅛ bbl. oil; Injun sand, T.D. 2,180 ft.
Hope 1 O. V. Goff, 1 bbl. Injun sand, T.D. 1,863 ft.
McCall Drilling Co. 2 Bud Kelly, 100,000 cu. ft. gas and ⅛ bbl., Injun sand, T.D. 2,289 ft.
Roberts & Weekley 2 G. O. Bonnett, 3 bbl. Maxton sand, T.D. 1,390 ft.
Glenville district: Pittsburgh & West Va., 7,776 B. M. Messenger, 280,000 cu. ft. gas; Big Injun sand 1,692-1,784 ft., gas 1,759-64 ft., T.D. 1,797 ft.

Marshall County

Cameron district: Cameron Light & Heat Co. 1 Elizabeth McConnough, 75,000 cu. ft. gas; Fourth sand, T.D. 3,090 ft.

Monongalia County

Clay district: Roy W. Clovis 3 G. W. & Perry Johnson, 497,280 cu. ft. gas, Gas sand 1,308 ft., T.D. 1,325 ft., Pittsburgh coal 615-21 ft.

Putnam County

Curry district: Summit Gas Co. 1 C. C. Paul, 118,400 cu. ft. gas; Salt sand 1,345-46 ft., T.D. 1,542 ft.
Edwards Gas Co. 1 J. T. Edwards & Frank Hall, 106,000 cu. ft. gas; Big lime 1,712-1,892 ft., Big Injun 1,950-80 ft., Berea 2,420-42 ft., T.D. 2,448 ft.
Midway City Gas Co. 4 Rufus Switzer, 440,000 cu. ft. gas; Big lime 1,398-1,565 ft., Big Injun 1,590-1,670 ft., Berea 2,056-76 ft., brown shale 3,247-3,630 ft., gas 3,248, 3,518, 3,604, and 3,630 ft., T.D. 3,650 ft.

Ritchie County

Clay district: J. H. Jones & S. E. Woodward 1 J. R. Doak, dry, Injun sand, T.D. 1,947 ft.
Murphy district: Clem S. Morris 1 C. W. Rexroad, 29,000 cu. ft. gas and 1½ bbl. oil, Injun sand, T.D. 2,034 ft.

Wirt County

Burning Springs district: Glen W. Roberts 1 N. M. Welch, dry, Berea, T.D. 2,473 ft.
Clay district: W. C. Patterson, 1 Johnson Tract, dry, Cow Run, T.D. 654 ft.

ORISKANY GAS FIELD

Kanawha County

Poca district: United Carbon Co. 1 A. S. Peters, 4,525,000 cu. ft. gas; before shot; Corniferous lime 4,658 ft., Oriskany 4,758 ft., T.D. 4,786 ft.
Godfrey L. Cabot, 4 J. L. McLean Heirs, 2,282,000 cu. ft. gas, Corniferous lime 4,965 ft., Oriskany 5,065 ft., T.D. 5,140 ft.

DRILLING

Poca district: United Fuel 4,892 J. A. Wines, top Corniferous lime 4,901 ft.
Godfrey L. Cabot, 1 Mary A. Mason, S.D. 4,960 ft., testing casing, Corniferous lime 4,853 ft., in the sand gas volume 420,000 cu. ft., Columbian Carbon 1 L. D. Reynolds, cementing casing; Corniferous lime 4,983 ft., Oriskany 5,097 ft., gas 146,000 cu. ft.
West Virginia Gas Corp. 1 J. C. Legg, top Corniferous lime 4,802 ft.
T. C. Matthews 1 Emily S. Higgenbotham, top Corniferous lime 4,951 ft.

Jackson County

Ripley district: United Fuel 4,890 J. F. Miller et al, 1,426,000 cu. ft. gas before shot; Corniferous lime 4,843-4,950 ft., Oriskany 4,950-83 ft., gas 4,950-56 ft., gas 4,964-70 ft., T.D. 4,983 ft.

North Louisiana-Arkansas

(Continued from Page 63)

sand at 1,224-51 ft. according to operators' reports. The test is now shut down awaiting orders.

Another possible producing horizon was encountered late last week in the deep Union Producing Co. 1-A Meadows, located north of the Lisbon field in Claiborne Parish. A core taken between 10,167 and 10,170 ft. showed odor of oil. Drilling and coring was resumed with testing the section. Late this week operators began moving oil string onto location. The test is located much higher than the other deep tests drilled in the area, but horizons in the Hosston and Cotton Valley formations have shown poorer production possibilities than in tests located down structure to the southwest.

NORTH LOUISIANA COMPLETIONS

Wildcat—Bossier Parish

L. K. McGuffin 1 Tomlinson.....SW NW SE 16-18-11
Dry, T.D. 1,220 ft.

Caddo—Caddo Parish

W. J. Anson 1 Dambly.....NE SW SE 2-20-16
Derrick, abandoned.
C. C. Bachellor 3 Stallcup.....NW NW NW 34-22-16
Dry, T.D. 2,603 ft.
J. W. Bailey 2 Muslow.....SW NE SW 32-21-15
Pumped 35 bbl., 4,000 gal. acid, 5½-in. casing 1,342 ft., T.D. 1,535 ft.
Lloyd A. Farr 8 Stiles.....NW SE SE 17-21-16
Pumped 20 bbl., T.D. 1,026 ft., 4½-in. casing 1,007 ft.
Gulf 271 Caddo Levee Board.....W½ E½ 16-20-16
Dry, T.D. 2,360 ft.
Gulf 14 Herndon.....SE NE SE 15-21-15
Pumped 52 bbl., 4,000 gal. acid, T.D. 1,673 ft., 6-in. casing 1,512 ft.
E. E. Johnson 1 Rosenbiath.....NE SW 32-21-15
Pumped 37 bbl., T.D. 1,533 ft., 4,000 gal. acid, 5½-in. casing 1,373 ft.
W. B. Johnson Drlg. Co. 5 Stiles..NW NW SW 22-21-16
Location abandoned.
J. E. Kemp 2 Hobbs.....NE SE NW 28-21-15
Pumped 40 bbl., 3,000 gal. acid, T.D. 1,525 ft., 7-in. casing 1,374 ft.
Pascal Pass 1 Tyrell.....1-20-16
Pumped 60 bbl., T.D. 1,512 ft., 3,000 gal. acid, 7-in. casing 1,380 ft.
Tippett Oil Corp. 3 Browning.....NW SW SW 22-22-16
Dry, T.D. 2,687 ft.
Sloan Wells 1 Stiles.....NW SE NW 32-21-16
Dry, T.D. 1,973 ft.
Woodley Co., Inc. 1 Browning...SW SW NE 33-22-16
Pumped 20 bbl., T.D. 2,466 ft., 6⅝-in. casing 2,453 ft.

Rodessa—Caddo Parish

Great National Oil Corp. 1 Means...W½ NE NE 9-23-15
10,000,000 cu. ft. open flow, T.P. 400 lb., T.D. 6,067 ft., 5½-in. casing 5,973 ft., perf. 5,832-36 ft., 5,859-62 ft., and 5,876-96 ft.

Sugar Creek—Claiborne Parish

Sugar Creek Syndicate 3 Robinson.....NW SW 33-20-5
Location abandoned.

Olla—La Salle Parish

Arkansas Fuel Oil 1-A Flowers....NE SW 12-10-2e
120 bbl., ¼-in. choke, 3 per cent B.s.&s.w., T.P. 400 lb., C.P. 700 lb., T.D. 2,232 ft., set 7-in. casing 2,232 ft., perf. 2,224-29 ft., lower central sand.
Arkansas Fuel Oil 1-B Lisenby.....NE NE 12-10-2e
Pumped 50 bbl., 75 per cent B.s.&s.w., T.D. 2,232 ft., 7-in. casing 2,232 ft., reperf. 2,212-17 ft., lower Central sand.
Placid 51 La. Central.....NW NW 1-9n-2e
240 bbl., 16 per cent B.s.&s.w., 20/64-in. choke, T.P. 210 lb., C.P. 560 lb., T.D. 2,414 ft., 7-in. casing 2,414 ft., perf. 2,242-48 ft., lower Central sand.
Placid Oil Co. 72 La. Central.....NE SW 30-10-3
217 bbl., 2 per cent B.s.&s.w., 18/64-in. choke, T.P. 380 lb., C.P. 670 lb., T.D. 2,411 ft., 7-in. casing 2,411 ft., perf. 2,222-32 ft., Mathews sand.

Wildcat—La Salle Parish

Coon & Ezzell 1 Herring.....NE SE SE 1-8n-3e
T.D. 55 ft., abandoned, will not drill.

Nebo—La Salle Parish

H. L. Hunt 6-A Goodpine.....SE SW 9-7n-3e
250 bbl., 12/64-in. choke, 24 per cent B.s.&s.w., T.P. 860 ft., C.P. 1,450 lb., T.D. 3,903 ft., 7-in. casing 3,903 ft., perf. 3,537-40 ft.

Wildcat—Nachitoches Parish

Research Drlg. Co. 1 Walker.....NE NE 9-10-10
Dry, T.D. 3,405 ft.

Wildcat—Tensas Parish

H. V. Schumacker 4 Mound Plantation.....39-11-12
Dry, T.D. 3,002 ft.

Monroe—Union Parish

Carbons Consolidated 1 Haile.....NE SW SE 16-21-3e
7,036,000 cu. ft. gas, R.P. 970 lb., T.D. 2,200 lb., 6-in. casing 2,152 ft.

ARKANSAS

Wildcatting in Arkansas continues very quiet, with field development also considerably less than earlier this year. A new test to be drilled to the Smackover lime was staked this week; C. H. Murphy 1-C Cates in the El Dorado field of Union County. A St. Francis County wildcat, U. S. Oil Corp. 1 Wilford, reports a show of live oil and gas at 1,728-32 ft. and is shut down at 1,732 ft., awaiting orders.

ARKANSAS COMPLETIONS

Wildcat—Lonoke County

Lunnon, Howell & Ford 1 City of Cabot, Lot 1, Blk. 6, 18-4n-9w, T.D. 1,374 ft., sandy shale, dry.

Nick Springs—Union County

Fohs Oil Co. 5 Grace.....NE SW NE 31-17-14
T.D. 3,568 ft., 81 bbl., 10/64-in. choke, T.P. 850 lb., C.P. 1,000 lb., 7-in. casing 3,568 ft., perf. 3,483-88 ft.

Urbana—Union County

Marine Oil Co. 4-A U. S. Mill.....NW SE SE 3-18-13
341 bbl., 18/64-in. choke, T.P. 250 lb., C.P. 450 lb., T.D. 3,211 ft., 7-in. casing 3,057 ft., perf. 3,000-08 ft.

EAST TEXAS BORDER DRILLING REPORT

Marion County

J. D. Parsons 1 T. W. Hook, Alexander Albright Sur., drilling 3,775 ft.

Panola County

Turner & Smith 2 Panola Dev. Co., George Gillespie Sur., drilling 3,578 ft.

Shelby County

Superior Oil Co. 4 Pickering, W. J. Crane Sur., T.D. 6,000 ft., prepare set casing.

By

F. L. SINGLETON

Gas-Distillate Field Opened On East Flank of Agua Dulce

CORPUS CHRISTI, Tex., Dec. 16.—The opening of a new gas-distillate area flanking the east side of the Agua Dulce field, Nueces County, announcement of four interesting wildcats for the county, and the testing of several important wells in wildcat and semi-proven territory featured developments in the Southwest Texas district the past week.

Development along the east flank of the Agua Dulce field, Nueces County, is expected to gain momentum following the completion of F. A. Gillespie & Son 1 Dabney which flowed an estimated 880,000 cu. ft. of gas and an unestimated amount of amber-colored distillate through a ½-in. choke. Tubing pressure was 2,450 lb., and shutin casing pressure 2,500 lb. The well was drilled to a total depth of 7,503 ft., and was completed through perforated casing at 7,216-21 ft. Just what relation this well has with the Agua Dulce structure cannot be determined until additional development is done. It is located 3 miles southeast of Banquette, and approximately 2 miles east of the Agua Dulce field. Since the opening of important crude production on the southeast flank of the Agua Dulce structure, leasing and royalty buying has been extremely active and several interesting wells are slated to be drilled along this trend in the near future.

Location for a 7,000-ft. test was made in the Clarkwood areas, Nueces County, by H. H. Howell et al who are rigging up for 1 D. C. Hellman in the E. R. Oliver Survey, Section 48. The same operator staked location for another 7,000-ft. test on the H. J. Mattiza lease, center Lot 2, W. B. Baker subdivision in the Gregorio Farias grant. Approximately 6 miles southeast of Orange Grove, Henshaw Brothers are preparing to spud 1 J. R. Dougherty, located in Share 7 of the Bluntzer Lands Partition of the Casa Blanca grant. The location is about 5 miles northeast of the King field. Location for another 6,500-ft. test is being started by H. J. Mosser et al on the Eggleston lease in Section 25 of the R. K. farm lots of the Agua Dulce grant.

SUMMARY OF COMPLETIONS

San Antonio District

	No.	Prod.	Footage
Oil wells	2	480	7,714
Dry holes	2	.....	1,306
Total	4	.....	9,020

Laredo District

	No.	Prod.	Footage
Oil wells: Colorado	5	939	14,877
Rincon	2	329	8,536
Glen	1	150	2,177
Other fields	1	14	5,210
Gas well	1	.....	1,454
Dry holes: Lundell	2	.....	3,462
Other fields	2	.....	7,116
Wildcats	5	.....	9,946
Total	19	.....	52,778

Lower Gulf Coast District

	No.	Prod.	Footage
Oil wells	10	1,378	65,783
Dry holes	1	.....	5,102
Dry holes: Wildcats	6	.....	30,801
Total	17	1,378	101,686

Mud Island Prospect

On the Mud Island prospect, offshore from Aransas County in Aransas Bay, Gulfboard 1-239 State is retesting sand at approximately 9,200 ft., but the results of the test were not available at the close of the week. Several promising sand sections are reported to have been logged, and completion of the well has been retarded by excessive gas pressures. Another marine operation was started in the district as Humble Oil & Refining Co. started drilling operations on 1-27 State in St. Charles Bay about 10 miles north of Rockport.

East of the Luby field, Seaboard Oil Co. 1 J. O. Chapman was slated to be completed as a gas or distillate well as the company plugged back from a total depth of 7,628 ft., and prepared to complete in sand at 4,025-32 ft., where a previous drill-stem test showed gas and distillate. The well is 1 mile east of the field in Section 78, Laureles Farm tracts, subdivision of the Chapman ranch in the Ramon de Hinojosa grant.

La Gloria Field

Magnolia 1 W. C. Hornsby, completed in January of this year as a distillate producer in the La Gloria field, Jim Wells County, is now flowing pipe-line oil. This well was used as a key well in making tests for the construction of a recycling plant in the field, and after standing shut in for several months, the well was opened last week to make additional tests, and it flowed 122 bbl. of 38.5-gravity oil in 16 hours through a ⅛-in. choke. Tubing pressure was 500 lb., and shutin casing pressure 1,900 lb. The well was completed at a plugged-back depth of 7,099 ft. for an initial production of 89 bbl. of distillate and 13,500,000 cu. ft. of gas with tubing pressure 2,850 lb. and shutin casing pressure 2,900 lb. The La Gloria structure extends over a large area and several sands which have been tested all showed gas or distillate.

East Flour Bluff Blowout

Humble 3-E State, an exploratory test located in the East Flour Bluff field, Nueces County, is being abandoned after an attempted blowout at 8,394 ft. The blowout occurred while drilling at this depth and the well began to kick and show gas outside of the casing which caused the well to crater in several places around the drilling barges. The well was brought under control by pumping in 2,888 sacks of cement, and the hole is being cemented from top to bottom with the drill stem still in the hole. This well was carried deeper after slight showings were logged in the 6,800-ft. pay.

Location for a new test was announced for the Thomaston Wilcox pool in De Witt County by Atlantic Refining Co. The new well which is the third to be drilled on the structure is 1 Hebert Zengerle, located in the Charles Lockhart Survey, about 4,100 ft. west of 1 W. E. Conwell, a recent completion and about the same distance northeast of 1 Pearl Conwell, the discovery well.

South Calliham Extension

In the Laredo district, a slight southeast extension was indicated for the South Calliham field, McMullen County, as Edwin M. Jones prepared to complete 99 Harry Ezzell, Section 3, Thomas Adams Survey. Sand showing oil was cored at 1,187-97 ft., the total depth, and casing was cemented on bottom.

In southeastern Zapata County, Hagen & Stewart 3-A Martinez located in the El Grullo grant No. 1, Block 84, is bailing drilling mud with a trace of oil from sand at 1,264-74 ft., the total depth.

Along the Balcones fault line district, F. L. Thompson 1 S. A. Winters, a wildcat located about 7½ miles northeast of Pearsall, Frio County, was being watched with considerable interest as it drilled ahead in the top section of the Edwards lime. The Georgetown lime was topped at 5,170 ft. and a slight show of oil was logged at 5,198-5,228 ft. A 37-minute drill-stem test at 5,179-5,228 ft. recovered 450 ft. of drilling mud with no show of oil. Soft lime which carried a slight show of oil was recovered at 5,236-38 ft. and this is believed to be the approximate top of the Edwards lime section.

SOUTHWEST TEXAS COMPLETIONS

Bee County

Wildcat: Dirks Brothers 1 Boothe, dry, T.D. 3,752 ft.
Magnolia 1 Page, dry, T.D. 3,962 ft.

Brooks County

Wildcat: West Prod. Co. 1 Ehlers, dry, T.D. 8,829 ft.

Jim Wells County

East Alice field: Tom Graham 1 Cook, 10 bbl., ¼-in. choke, T.D. 5,176 ft.
Orange Grove field: Frank Buttram 1 Eineigl, dry, T.D. 5,102 ft.

Goliad County

Wildcat: Banks Miller Oil Co. 1 McFaddin, dry, T.D. 5,529 ft.

Nueces County

Agua Dulce field: L. M. Lockhart 6 Purl, 100 bbl., ⅞-in. choke, perf. casing 5,680-95 ft., T.D. 6,967 ft.
Texon Royalty Co. 1 Walton, 125 bbl., ⅞-in. choke, perf. casing, 6,900-10 ft., T.D. 7,035 ft.
East White Point field: W. R. R. Oil Co. 5-973 State, 134 bbl., 7/64-in. choke, perf. casing 5,535-45 ft., T.D. 5,863 ft.
Richard King field: Southern Minerals 16-B King, 118 bbl., ⅛-in. choke, perf. casing 5,646-50 ft., T.D. 5,655 ft.
Clara Driscoll field: Sun 1 Robertson, 51 bbl., 20 per per cent salt water, ¼-in. choke, perf. casing 3,819-22 ft., T.D. 3,825 ft.
Wellington 2-B Driscoll, 53 bbl., 11/64-in. choke, perf. casing 5,293-5,303 ft., T.D. 5,304 ft.
East Flour Bluff field: Humble 1-F State, 275 bbl., ¼-in. choke, T.D. 6,809 ft.
Stratton field: Navarro 1 Sellers, 232 bbl., 5/32-in. choke, perf. casing 6,452-64 ft., T.D. 6,588 ft.
Southern Minerals Corp. 5 Stratton, 65 bbl., 3/32-in. choke, perf. casing 6,609-25 ft., T.D. 6,636 ft.

Refugio County

Tomoconnor field: Quintana 16-A Heard, 215 bbl., ⅛-in. choke, perf. casing 5,738½-42½ ft., T.D. 5,925 ft.

San Patricio County

Wildcat: Henderson Coquat 1 Michel, dry, T.D. 6,014 ft.

Victoria County

Telferner field: Sunray 2 Fimbel, dry, T.D. 2,715 ft.

LAREDO DISTRICT

Duval County

Casa Blanca field: Magnolia 8 Duval County Ranch Co., dry, T.D. 1,341 ft.
Lundell field: Magnolia 2 Duval County Ranch Co., dry, T.D. 1,704 ft.
Magnolia 20 Duval County Ranch Co., dry, T.D. 1,758 ft.
Cedro Hill field: Magnolia 17 Duval County Ranch Co., sand 1,450-54 ft., gas well.
Tesoro field: R. J. Grant 1 Cuellar, dry, T.D. 5,775 ft.
Wildcat: Robert Coker et al 1 Smith-Corkill, dry, T.D. 3,521 ft.
Pocono Development Co. 1 Adami, dry, T.D. 1,359 ft.

Jim Hogg County

Colorado field: C. Andrade 4-D Trevino, 198 bbl., ¼-in. choke, sand 2,937-46 ft., T.D.
Humble 2-B King, 182 bbl., ⅞-in. choke, T.D. 2,979 ft.
Humble 3-B King, 186 bbl., ⅞-in. choke, T.D. 2,998 ft.
V. F. Neuhaus 4-B Trevino, 175 bbl., 1/5-in. choke, T.D. 2,992 ft.
Sun 14 Thaxton, 198 bbl., ⅞-in. choke, sand 2,948½-62 ft.

Live Oak County

Wildcat: Humble 1 Butler, dry, T.D. 1,517 ft.

Starr County

North Rincon field: Harvey et al 1 Davenport, 14 bbl., pumping, T.D. 5,210 ft.
Rincon field: Continental Oil Co. 18-A Slick, 193 bbl., ⅞-in. choke, T.D. 4,200 ft.
Continental 39-B Slick, 131 bbl., ⅞-in. choke, T.D. 4,236 ft.

Zapata County

Glen field: Transwestern 1-B Yeager-Stroman, 150 bbl., pumping, sand 2,167-77 ft., T.D.
Wildcat: Fidelity Oil & Royalty Co. 1 Gopher, dry, T.D. 2,018 ft.
Texas 137 Measles, dry, T.D. 1,521 ft.

SAN ANTONIO DISTRICT

Bexar County

Wildcat: G. Shelton 2 Gembler, dry, T.D. 760 ft.

Caldwell County

Luling field: Murchison et al 4-B Jennings, 40 bbl., pumping, T.D. 2,076 ft.

Frio County

Pearsall field: Texas Atlas Petroleum Corp. 5 Cory & McWilliams, 440 bbl., open tubing, T.D. 5,638 ft.

Travis County

Wildcat: Ralph Janer 1 Larremore, dry, T.D. 546 ft.

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Among the Drilling

W. STEWART BOYLE, Houston, Tex., staked location for 1 Mauritz, a projected 6,200-ft. wildcat located 4 miles southeast of Ganado in the Morris and Cummings Survey, Jackson County, Texas.

O. W. DYER is moving in material for a new operation in the Thomaston field, De Witt County, Texas, for Atlantic Refining Co. The well is 1 Hebert Zengerle, an 8,500-ft. test located about 4,000 ft. northeast of the discovery well.

HENDERSON COQUAT, Three Rivers, Tex., is scheduled to move a rotary to Live Oak County, Texas, where location was made for 1 Goebel, an 8,000-ft. test located about 3½ miles northeast of Oakville in the Refugio County School Lands Survey 6.

CARPER Drilling Co., Artesia. N. M., last week completed its 4-N Simon in the Maljamar field of Eddy County, New Mexico, for a flow of 130 bbl. daily through 2-in. tubing set at 3,669 ft. The well was shot with 40 qt. from 3,740 ft., where pay was topped to 3,770 ft., 9 ft. off bottom. Location of 1 Simon is 1,980 ft. from the north and 660 ft. from the west line of 29-17s-32e.

HENSHAW BROTHERS, San Antonio, Tex., is rigging up in Nueces County, Texas, for its 1 J. R. Dougherty, a 6,500-ft. test located about 5 miles southeast of Orange Grove in the Casa Blanca grant.

ALLEN & MORRIS, San Antonio, Tex., have started drilling operations in the newly opened Willamar field, Willacy County, Texas, on Pan American Production Co. 1-G Willamar Community, an offset to the discovery well. One mile east of the Luby field, Nueces County, Seaboard Oil Co. 1 Chapman estate has been plugged back from a total depth of 7,628 ft., and a production test is being made at approximately 4,025 ft. Drilling continues on Coronado Corp. 6 Welder, a wildcat located in the Duck Bay field, Calhoun County, Texas, while a new operation was started in the East White Point field for W. R. R. Oil Co.

PARKER Drilling Co., Tulsa, is waiting for new derrick and rotary rig to be delivered in order that it may carry Gulf Refining Co. 1 Bateson in Bay County, Michigan, to its original objective. The derrick and rotary used to carry the test to 7,776 ft. was destroyed earlier this month when the well blew out and caught fire. Only the mud pump was believed salvable. Whether the full string of 4½-in. drill pipe, backed off at the top joint below the kelly before the fire, can be recovered will not be determined until the well is rerigged. A new 136-ft. derrick is en route to the well site and a new rotary, powered by two 275-hp. diesel engines, has been ordered. Location of 1 Bateson, which established a record depth for Michigan, is in Monitor Township, C S½ SE SE 2-14n-4e.

T. A. CARLTON Drilling Co., Houston, Tex., is scheduled to move a rotary to Waller County, Texas, for the company's joint wildcat test located on the east flank of the San Felipe dome, where 1 P. H. Donigan will be drilled to the Wilcox sand.

H. A. NELSON, Dallas and Fort Worth, Tex., has been given drilling contract for a new wildcat in the Whitehouse community of Smith County, eastern Texas. It will be drilled for O. L. Ross and associates of Beaumont as 1 C. H. Willingham, on a 64-acre tract in the Jacob Harrin Survey. Contract depth is the Woodbine sand expected at about 4,500 ft. The test is 8 miles southeast of Tyler and about 6 miles southwest of the Chapel Hill area of Smith County.

HOUSH & THOMPSON Drilling Co., Houston, Tex., is preparing to test Phillips 1 Houston Farm Development Co., an outpost well located in the Chocolate Bayou field, Brazoria County, Texas. Two other operations are reported in coastal Louisiana for William & King at the Sorrento dome, Ascension Parish, and at the Edgerly field for Gulf Refining Co.

DELTA Drilling Co., Tyler, Tex., has taken over from Shell Oil Co., Inc., a deep test to deepen to the 8,000-ft. level. The test is 1 Browning, McDonald Survey, which Delta drilled under a contract for Shell to the 5,880-ft. level for a test of the Paluxy sand. The drilling company will continue to the deep levels for tests of the Glen Rose and Travis Peak sections. The firm is moving in a heavier rotary rig for the deepening operation.

SNYDER & HEAD, drilling contractors of Calgary, Alta., Canada, have started drilling on Inland Development Co. 1 Sarcee Indian Reserve in LSD 2, 4-23n-4w5, in Alberta Province. The well is located on a 1,920-acre block leased by Inland from Highwood-Sarcee Oil Co., which has an 18,000-acre lease on the western half of the Sarcee reserve. Operators plan to carry hole to around 2,000 ft. with cable tools then switch to rotary for completion. Principal objective, the Madison lime, is expected at around 6,500 to 7,000 ft. Snyder & Head also have been awarded contract for drilling a well on the west-central flank of the Turner Valley field of Alberta. It is being drilled for Allied Royalties, Ltd., and is located in LSD 15, 6-19n-2w5. Drilling is expected to get under way before the first of the year.

H. H. HOWELL, Alice, Tex., is moving in material for two 7,000-ft. wildcat tests located in Nueces County, Texas. No. 1 D. C. Hellman in the E. R. Oliver Survey, is being rigged up, while derrick is up for 1 H. J. Mattiza in the Gregorio Farias grant.

WIEGAND BROTHERS, San Antonio, Tex., is completing a well in the Pearsall field, Frio County, Texas, for Falcon-Seaboard Oil Co. In the Tinney Creek field, Caldwell County, Texas, a production test is being made at their 1 E. E. Brown.

R. A. T. WRIGHT, drilling contractor of Grand Rapids, Mich., may have opened a new play for Overisel Township last week when 1 Campagner, being drilled for Walter McClanahan, filled 800 ft. with oil natural and flowed after acidizing. The 1 Campagner, in SW SE SE 11-4n-14w, over 2 miles east and north of McClanahan's production in Section 16, and 1½ miles east of any previously drilled wells, topped the Traverse lime at 1,552 ft. Hole was bottomed at 1,553 ft. The wildcat was estimated as having an initial potential of 200 bbl. daily.

HARRY L. EDWARDS Drilling Co., Houston, Tex., received contract for three wells, and material is being moved in. In the Abbeville field, 1 Motty is being spudded for Continental Oil Co., while in the Dickinson field, Galveston County, Texas Gulf Coast, derrick is up for a new test for Pan American Production Co. In the West Ranch field, Jackson County, Texas, a rotary is being moved in for Midstates Oil Co. On the Mud Island prospect, offshore from Aransas County in Aransas Bay, Gulfboard 1 State is being tested, while in the Esperson and Old Ocean field, Liberty and Brazoria counties, Texas, two rotaries

Contractors

are running for W. P. Luse and Harrison & Abercrombie.

FALCON-SEABOARD Drilling Co., at a wildcat gas test being drilled for Hope Natural Gas Co. in West Virginia, have reached a depth below 8,585 ft. The test is being drilled in Harrison County, near the town of Lost Creek, and is the first of the northern part of the state to penetrate the Clinton sand, which lies about 1,000 ft. below the Oriskany. A mechanical-electrical rig is being used, the first rotary rig to drill a well in West Virginia. Work on the well was started about 5 months ago.

OSAGE Drilling Co., Inc., Oklahoma City, Okla., is rigging up rotary preparatory to starting a recently staked wildcat for Fuhrman Petroleum Corp. in Andrews County, West Texas. It is 1 Lockhart & Brown, located 467 ft. from the north and east lines of Section 24, Block 42-A, P.S.L. Survey, about 2½ miles west of the Fuhrman field in Andrews County.

SULTANA Drilling Co., Shreveport, La., has received contract from Southern Production Co., Birmingham, Ala., a gas development company, for the drilling of six wells in the Logansport, La., district. Four of the tests are to be drilled on acreage farmed out from Ohio Oil Co. and are to be completed by April 15, 1941. Two of the tests are to be drilled on acreage obtained from Pure Oil Co. and the first must be started by December 15, 1940, and followed by a second within 60 days. The locations for the tests center around 11-12-16. The first to be started is 1 Alston and Frost Johnson, 11-11-16, and has cemented casing at 1,703 ft. The 1 Gannon and Frost Johnson was ready to spud. It is in 12-11-16.

W. B. OMOHUNDRO, drilling contractor of Wichita Falls, Tex., has staked a new wildcat in the Ringgold area of Montague County, North Texas. It is 1 I. V. Parr, 1,400 ft. from the south and 467 ft. from the west lines of a 500-acre tract in the T. G. Simmons Survey, about 2 miles northeast of the town of Ringgold. The operator and contractor closed a deal with M. T. McLaughlin of Wichita Falls for a 6,000-ft. test on his 2,000-acre block assembled during the peak play of the Fort Worth basin several months ago.

REESE Drilling Co., Tulsa, is due to start work within a week on its 1 Replogle in the Dill pool of Okfuskee County, Oklahoma. Location of the well is ¼ mile northeast of the field's present limits in NE NE NE 2-11n-8e.

GROOVER & ROSE, Albany, Tex., are indicating the discovery of a new Cook sand field for Danciger Oil & Refineries, Inc., Fort Worth, Tex., at a wildcat being drilled in southern Jones County, West Central Texas. It is 1 F. B. Kelso, about 2 miles west of the Akard field, also Cook sand production, and is located 882 ft. from the west and 330 ft. from south lines of Lot 2, Godwin subdivision, De Witt County School Lands, in extreme southern Jones County. At the week end plug had not yet been drilled from 7-in. casing set at 2,336 ft. on top of saturation drilled to a total depth of 2,338 ft.

TWIN Drilling Co., Tulsa, last week found the Dundee lime pay dry at 3,018 ft. in a Foster Township, Ogemaw County, Michigan, wildcat drilled for Gulf Refining Co. The test, 1 Garber, in SW SW 8-24n-1e, topped the Dundee at 2,909 ft.

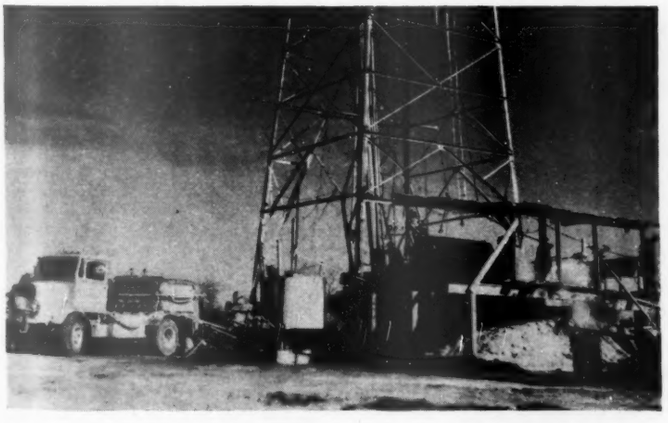
TEMPLE & LENINGER, drilling contractors of Grand Rapids, Mich., are nearing completion of one of the best wells completed to date in the Salem Township field of Allegan County, Michigan. The 2 Smith, drilled for Michigan Devonian Petroleum Co., at last reports was pumping and flowing 9 bbl. hourly after acid. The prospective producer, located in NE SE NW 15-4n-13w, topped the Traverse lime at 1,580 ft. and is bottomed at 1,585 ft.

CROSBY Drilling Co., Houston, Tex., is running casing on M. McMurray 1 Allen, a wildcat located 10 miles east of Halletsville in Lavaca County, Southwest Texas. The well is bottomed at 8,523 ft., and 5½-in. casing is being cemented to test encouraging showings cored in the Wilcox sand. Southwest of the Alta Loma field and located in Brazoria County, Texas, material is being moved in for Strake Petroleum Co. 1 L. E. Griffity, a projected deep test located in the H. P. Cayce Sur.

OWNBY Drilling Co., Houston, Tex., has moved a rotary to the Placedo field, Victoria County, Texas Gulf Coast, where drilling is being started on the company's 1 John F. Marek, a projected 4,900-ft. test located in the S.A.&M.G. Survey 8.

LUPHER Drilling Co. of Mount Pleasant, Mich., at last reports was drilling below 1,850 ft. at 6 Thayer in the Vernon field of Isabella County, Michigan. The well, drilled for Nollem Oil Co., is located in SE NW SE 22-16n-4w.

TRINITY DRILLERS, Inc., San Antonio, Tex., opened a new producing area, flanking the east side of the Agua Dulce field, in Nueces County, Texas, with the completion of F. A. Gillespie & Sons 1 Dabney, 2 miles east of the field. The well was completed through perforated casing at 7,216-21 ft., for a gas and distillate producer.



A. O. Olson Drilling Co. has discovered a new gas-condensate field in Claiborne Parish, North Louisiana. The test, drilled for V. A. Hardin, and taken over by Skelly Oil Co. and Sunray Oil Co., is located on the Athens prospect and is producing about 5½ bbl. of condensate hourly at a gas rate of approximately 1,632,000 cu. ft. daily. The test is bottomed at 6,507 ft. The accompanying view shows the well being cemented

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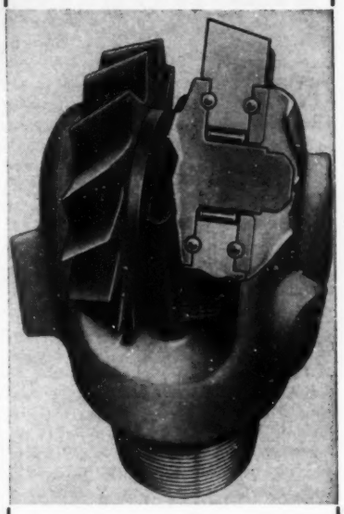

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Knox Co. Gas Development Highlights Central Area

By STAFF CORRESPONDENT

NEWARK, Ohio, Dec. 14.—Of the 28 wells completed in the Ohio fields, 16 were gas wells, 6 were oil wells and 6 were dry. Tuscarawas County yielded two small gassers in the Clinton horizon at 5,000 ft. Activity in the area on the western edge of Danville in Knox County has been increased by the completion of another gas well gaging better than 2,000,000 cu. ft.

The Central Ohio deep test of McCloy, Inc., in the southeast part of Jersey Township, Licking County is drilling in a dolomitic lime at 4,209 ft., 889 ft. below the top of the Trenton, with a small amount of water in the hole. The Blue Lick water has not been encountered.

In Columbiana County, Ohio, the Natural Gas Co. of West Virginia topped the Onondaga at 4,177 ft. in the wildcat on the William Tice farm, Section 19, Wayne Township, or subsea 3,008 ft. It is drilling at 4,187 ft. In Belmont County, their test scheduled for the Clinton sand on the E. A. Mobley farm, Section 19, Smith Township, is drilling at 7,000 ft.

Ashland County

Lake Township: Gold Crown 10 C. D. Easley, Sec. 21, dry, Berea, T.D. 635 ft.
Perry Township: Alleghany Dev. Co. 1 John Harpster, Sec. 17, 5 bbl., shot, Berea, T.D. 808 ft.

Athens County

Rome Township: Ohio Fuel 2 H. A. Hatch, Sec. 1, dry, Berea, T.D. 1,855 ft.
Cook et al 4 M. B. Copeland, Fraction 36, 50,000 cu. ft. gas, 2nd Cow Run, T.D. 631 ft.
York Township: Cody 2 Earl White, Fraction 32, dry, stray, T.D. 456 ft.

Holmes County

Hardy Township: Bell Bros. 1 O. J. Finley, Sec. 17, 30,000 cu. ft. gas, Berea, T.D. 864 ft.

Knox County

Union Township: Village of Danville Upham 1 E. Mowery, Sec. 5, 2,800,000 cu. ft., gas, Clinton, T.D. 2,766 ft.

Newark Field—Licking County

Mary Ann Township: Moore Bros. 1 D. D. Walker, Sec. 17, 1,900,000 cu. ft., Clinton, T.D. 2,602 ft.
Ohio Fuel 1 C. C. Roe, Sec. 16, 115,000 cu. ft. gas, Clinton, T.D. 2,635 ft.
Ohio Fuel 2 Roy Nesbitt, Sec. 16, dry, Clinton, T.D. 2,562 ft.
Newark Township: Jas. McCloy 1 G. M. Roley, west part, 1,950,000 cu. ft. gas, Clinton, T.D. 2,344 ft.
Gail Earley et al 1 Geo. Patterson, west part, 550,000 cu. ft. gas, Clinton, T.D. 2,352 ft.
Lacknette et al 2 Geo. J. Weber, 1st Quarter, 430,000 cu. ft. gas, Clinton, T.D. 2,448 ft.
Everette Company 2 Mound Mortgage Company, 1st Quarter, 450,000 cu. ft. gas, shot, Clinton, T.D. 2,400 ft.

Lorain County

Penfield Township: Wiser Oil 2 Homer Sooy, Lot 20, Sec. 2, 330,000 cu. ft. gas, Clinton, T.D. 2,441 ft.

Medina County

Chatham Township: Fred C. Shaner et al 1 Forence Gunsault et al, Lot 44, Chatham Village, 2 bbl., Berea grit, T.D. 502 ft.

Meigs County

Rutland Township: Bengel 1 Frank Graham, Sec. 26, 240,000 cu. ft. gas, 2nd Cow Run, T.D. 541 ft.
Sutton Township: Roush Bros. 2 W. D. Roush, Sec. 30, 130,000 cu. ft. gas, shot, Ohio shales, T.D. 3,281 ft.
Sumner Oil & Gas Co. 5 Eber Roush, Lot 290, 150,000 cu. ft. gas, shale, 3,103 ft.

Monroe County

Washington Township: Walker 1 C. Ullman, Sec. 5, 1 bbl. Salt sand, shot, T.D. 1,570 ft.

Noble County

Center Township: Barnesville Development Co. 1 Otto E. Heisler, N½ Sec. 23, dry, Clinton sand, T.D. 5,800 ft., deep wildcat Clinton sand at 5,599-5,686 ft. badly broken, no showing of oil, about 25,000 cu. ft. gas.
Enoch Township: Gerst et al 1 Alex Bettinger, Sec. 27, 10 bbl., Maxburg 500-Foot sand, T.D. 605 ft.

Perry County

Claytown Township: Pure 4 Martha Miller, Sec. 18, dry, Clinton, T.D. 3,278 ft.

Tuscarawas County

Fairfield Township: East Ohio 1 P. A. Christ, Lot 3, 240,000 cu. ft. gas, shot, Clinton, T.D. 4,998 ft.
Status Dev. Co. 1 Fred Ludi, Sec. 14, 380,000 cu. ft. gas, shot, Clinton, T.D. 5,007 ft.

Washington County

Barlow Township: Campbell 1 A. H. Mercer, Sec. 11, 112,000 cu. ft. gas, Stray, T.D. 1,210 ft.
Fearing Township: Lorentz Bros. 5 fee, Lot 103, 5 bbl., shot, Mackburg 500-Foot sand, T.D. 981 ft.
Liberty Township: Henning et al 5 Michael Cullen, Sec. 21, 35 bbl., and 100,000 cu. ft. gas, not shot, Keener, T.D. 1,360 ft.
Koon Run Oil 4 G. C. Hendershot, Sec. 22, dry, Injun, T.D. 1,445 ft.

SUMMARY OF COMPLETIONS

Ohio

	No.	Prod.	Footage
Oil wells	6	*58	10,783
Gas wells	16	†10.0	39,629
Dry holes	6	.....	11,024
Total	28	.....	61,436

Indiana

Oil wells	5	*688	11,649
Gas wells	3	†1.0	2,420
Dry holes	8	.....	11,756
Total	16	.....	25,825
Recompletion	1	366	.....

Eastern Kentucky

Gas wells	3	†0.2	8,569
Dry holes	1	.....	829
Total	4	.....	9,398

Western Kentucky

Oil wells	4	*90	4,168
Gas wells	1	†1.0	1,681
Dry holes	5	.....	3,949
Total	10	.....	9,798

*Barrels. †Million cu. ft.

INDIANA

EVANSVILLE, Ind., Dec. 16.—Indiana had a busier week than usual as far as completions were concerned, with the completion of six oil wells, three gassers, and nine dry holes. Total initial production for the six oil wells was 1,054 bbl., or 176 bbl. per well, while the three gassers produced 289,800 cu. ft. The only completions reported in the Vincennes pool of Knox County were two dry holes. This pool has proved to be very spotty and the only completions reported for the pool during the past few weeks have been dry holes.

INDIANA COMPLETIONS

Dearborn County

Southeastern Ind. O. & G. 2 Hurefeld.....NE NW NW 15-5n-1w
Dry, T.D. 800 ft.

Decatur County

Westport Nat. Gas 1 Bilbin.....NW NW SW 8-8n-9e
50,000 cu. ft. gas, T.D. 856 ft.
Hoosier Public Util. 217 Schoettmer SE NE 14-9n-9e
159,000 cu. ft. gas, Trenton 885 ft., 110-qt. shot 885-925 ft., T.D. 925 ft.

Gibson County

R. L. Bauman et al 1 Kleiderer..SE SE SE 28-3s-14w
Location abandoned.
Cherry & Kidd et al 1 Hall..SW NW SW 31-2s-12w
Dry, St. Louis 2,750 ft., T.D. 2,802 ft.
Continental 17 Bozeman.....NE NE NW 25-3s-14w
Pumped 125 bbl. oil and 121 bbl. water, perf. 2,890-92 ft., 2,000 gal. acid, T.D. 2,950 ft.

Hancock County

Oaklander Gas 1 Bail.....26-17n-5e
Dry, Trenton 900 ft., T.D. 918 ft.

Harrison County

Ind. Util Corp. 1 Wheat.....NW NE SE 32-3s-4e
Dry, T.D. 731 ft.

Knox County

W. C. McBride 1 Schaller.....SE SE SE 23-2n-11w
Location abandoned.
Bell Brothers 1 Stangle.....NW NW NE 23-2n-11w
Dry, Glen Dean 1,470 ft., Golconda 1,575 ft., Renault 1,790 ft., Ste. Genevieve 1,810 ft., McClosky 1,901 ft., slight show oil 1,901-02 ft., T.D. 2,001 ft.
Midwest et al 1 Montgomery..SW NW SW 12-2n-11w
Dry, T.D. 1,936 ft.

Posey County

W. C. McBride 1 Swanders.....NW NW NE 4-4s-14w
Old well drilling deeper, old T.D. 2,551 ft., 30-qt. shot 2,604-21 ft., pumped 366 bbl., T.D. 2,623 ft.
W. C. McBride 7 Swanders.....SE SW NE 4-4s-14w
Pumped 175 bbl. oil and 36 bbl. water, natural, pay 2,613-29 ft., T.D. 2,629 ft.
Tide Water 2 Doll.....SW SW SE 33-3s-14w
T.D. 2,788 ft., P.B. 2,620 ft., 20-qt. shot 2,604-20 ft., pumped 130 bbl.
C. W. McKeeken et al 3 Keck..SW NW NW 35-3s-14w
Pumped 250 bbl., 115-qt. shot 2,508-80 ft., T.D. 2,580 ft.

Spencer County

Hunt et al 1 Lusk.....N½ N½ 5-8s-6w
808,000 cu. ft. gas, sand 629-39 ft., R.P. 260 lb., T.D. 639 ft.
Damron Brothers 1 Kincaid.....NE SE SW 19-7s-6w
Dry, T.D. 925 ft.
Troy Refining 5 Anderson.....SW SE NE 11-6s-4w
Pumped 8 bbl., 35-qt. shot 684-702 ft., T.D. 702 ft.
Jim Ellis et al 1 Fisher.....E½ SW NE 29-7s-6w
Dry, Ste. Genevieve 1,470 ft., T.D. 1,643 ft.

INDIANA DRILLING REPORT

Greene County

L. B. Jackson et al 1 Holmes NW NW NW 22-7n-6w
25,000 cu. ft. gas 1,664-68 ft., 431,000 cu. ft. gas 1,707 ft., water 1,732 ft., S.D. 1,734 ft.
Commonwealth 1 L. L. Tucker NE SE NE 16-6n-6w
Set 6-in. 1,745 ft., drilling 1,745 ft.

Knox County

W. C. McBride 1 Brevoort.....SW NE NW 1-2n-11w
T.D. 1,973 ft., P.B. to 1,865 ft., set 7-in. 1,860 ft., removable pipe 1,816-34 ft., waiting on cement, P.B. 1,865 ft., drilled out to 1,866 ft., 1,500 gal. acid, swabbed 11 bbl. water per hr., will P.B. 1,816-34 ft.
Loma Oil 1 Sanneman.....NW NW SE 24-2n-11w
Set 5½-in. 1,856 ft., T.D. 1,902 ft., waiting on cement.

Spencer County

H. M. Hunt et al 1 Seay-Miller Comm.....W½ NW SW 32-7s-6w
Drilling 1,250 ft.

Sullivan County

T. H. Drake 1 Curry.....NE SW 11-9n-8w
Location.
W. J. Reynolds 1 Poe.....NE NE SW 3-8n-10w
Set 8-in. 910 ft., drilling 910 ft.

Vigo County

H. N. Oakley 1 Seibold.....NW NW SW 18-3n-8w
Set 10-in. 140 ft., 8-in. 524 ft., Ste. Genevieve 492 ft., water 517-23 ft., drilling 1,150 ft.

WESTERN KENTUCKY

OWENSBORO, Ky., Dec. 16.—Ten wells were completed in western Kentucky during the past week. Of these, four were oilers, one was a gas well, the remaining five being shallow dry holes.

Butler County

Huntsville district: Cumberland et al 4 Brown heirs, 20 bbl., 60-qt. shot, Jones sand 385-403 ft.

Daviess County

Utica district: Sargent et al 1 S. A. Burns, dry through McClosky, T.D. 1,887 ft.
Schaffer et al 4 William Johnson, west tract, 40 bbl., 70-qt. shot, Barlow sand 1,388-1,408 ft., 80-qt. shot, Bethel sand 1,450-70 ft., T.D. 1,473 ft.
Creek Drilling Co. 3 Rex O'Flynn, 20 bbl., 60-qt. shot, Barlow sand 1,338-69 ft., T.D. 1,378 ft.
Mace district: Hart & Hart 2 Mrs. Mary Haywood, dry, 20-qt. shot, Jackson sand 889-906 ft.
Red Hill district: Raydeur et al 7 Herbert Salmon, 10 bbl., 40-qt. shot, Jones sand 892-909 ft., T.D. 914 ft.

Hancock County

Saunders School district: Fordsville Oil Co. 1 Thomas Hale, dry through Jett, T.D. 447 ft.

McLean County

Glenville district: Ohio 5 G. B. McManama (Acct. 2), 1,000,000 cu. ft. gas, and 4,000 gal. acid, McClosky 1,643½-51 ft., T.D. 1,681 ft.

Ohio County

Taffy district: E. J. Corless 1 L. C. Hoover, dry 345 ft.
Fordsville district: H. M. Hunt 3 R. A. Rusher, dry through Jett sand, T.D. 364 ft.

EASTERN KENTUCKY

ASHLAND, Ky., Dec. 16.—Three gas-well completions and a dry hole mark the drilling activities in eastern Kentucky this week.

Cumberland Petroleum's deep test on Little Paint Creek in Magoffin County, Oil Springs district, 24 L. C. Bailey, has quit caving. With a present depth of 3,170 ft. the operator expects to drill through present structure and finish the well. Gas volume has dropped from 90,000 to 35,000 cu. ft. No. 46 on the same tract is down 484 ft.

Gus McKinney hit a dry hole in 1 Sparks Winthers and Adams, at Sta Camp in Estill County, with the well reaching a total depth of 829 ft.

Kentucky-West Virginia Gas Co. has completed 600 J. S. Cline on Island Creek in Pike County, at a total depth of 3,265 ft. The well is making 39,000 cu. ft. of gas daily in shale with 48-hour rock pressure of 402 lb.

Kentucky-West Virginia Gas Co. reports the completion of 5115 J. L. Spurlock, in Knott County, at a total depth of 2,449 ft. in shale and the well is producing 103,000 cu. ft. of gas per day.

Kentucky-West Virginia Gas Co. has also completed 5279 Henderson Roberts on Big Branch of Little Mud Creek in Floyd County at a total depth of 2,855 ft. in shale and the well is producing 46,000 cu. ft. of gas per day.

By
STAFF CORRESPONDENT

West Liberty Extension Gets Best Producer of Week

MATTOON, Ill., Dec. 16.—An unusually large number of dry holes were completed in Illinois during the past week as 29 of 76 completions were dry. This is nearly double the average number of dry holes completed per week in the state. The remaining 47 completions were oil wells with an initial production of 9,482 bbl., or 202 bbl. per well. Of the major fields, Louden reported five producers and a dry hole completed for 392 bbl., while three producers and a dry hole were completed for 323 bbl. in the Albion pool. White County activity declined slightly as 1 dry hole and 19 producers were completed. Production for the county remained normal with the 19 oil wells good for 3,351 bbl. Of the 20 completions, 11 producers were in the East Calvin pool and had an initial production of 1,903 bbl. This was an increase of six producers over the number completed in the pool during the previous week. The remaining 47 completions were in various scattered counties of the basin area and included 20 producers with an initial production of 5,416 bbl., or 271 bbl. per well.

SUMMARY OF COMPLETIONS

	No.	Prod.*	Footage
Oil wells: Albion	3	323	9,803
Louden	5	392	7,719
Hoodville	2	245	5,931
East Calvin	11	1,903	29,892
Other White County pools	6	1,245	14,764
Other pools	14	3,114	39,403
Wildcats	5	1,833	13,862
Dry holes: Fields	†9	.....	22,061
Wildcats	21	.....	37,411
Total	76	.....	180,845
Gas-input well	1	.....	1,227

*Barrels. †Centralia 1, Albion 1, Louden 1, North Boos 2, Dundas 2, Lancaster 1, and Enterprise 1.

Jasper County

Pure 1 J. Rohr, W½ NW NW 4-5n-10e, Jasper County, was the largest producer completed during the week. This well flowed 1,345 bbl., natural, and 1,306 bbl. after an acid treatment of 5,000 gal. Production was from the McClosky at 2,762-71 ft. The discovery well of this area, Schiek and Buerkles 1 Payne Heirs, S½ NE NE 5-5n-10e, was completed several weeks ago in the McClosky for 789 bbl. Pure Oil Co. is testing two other wells in this area. These wells are about 1½ miles north and slightly east of the nearest production in the West Liberty pool in the extreme southern part of the county, and will probably mark an extension of this pool. Production in the West Liberty pool is from the McClosky.

Clinton County

Bell Oils 1 Maibaum, NE SE SE 12-3n-3w, Clinton County, a wildcat test being drilled about 8 miles north of Carlyle, Illinois, found saturation in the Benoist from 1,152-59 ft., during the early part of last week.

This well is 1,000 ft. northeast of Fox 1 Maibaum, a test drilled more than a year ago which found a show of oil but was later abandoned. Bell 1 Maibaum reportedly topped saturation 9 ft. higher than did the earlier test. At an elevation of 470 ft., the Benoist section was topped at 1,129 ft.; 5½-in. casing was cemented at 1,156 ft., because the first 4 ft. of saturation were shaly.

ILLINOIS COMPLETIONS

Bond County

Wildcat: P. Holleman 1 Basten, NE NW SE 25-4n-3w, dry, Glen Dean 840 ft., Benoist 1,124 ft., T.D. 1,155 ft., elev. 482 ft.

Clinton County

Centralia pool: Adams 27 Copple, NW SW SE 35-2n-1w, gas input well, T.D. 1,227 ft., Cypress.
Wildcat: Nat. Cons. 1 Fricke, NW SE SW 14-1n-2w. dry, Golconda 1,075 ft., Cypress 1,197 ft., Benoist 1,368 ft., T.D. 1,372 ft.

Coles County

Wildcat: W. R. Miller 1 S. P. Taylor, SE SW NE 33-14n-10e, dry, show oil 80 ft., show gas 146 ft., Penn. sand 265-68 ft., 20-qt. shot, bailed est. 6 bbl., T.D. 900 ft.

Edgar County

Wildcat: J. P. Economos 1 Wieland, NE NE NE 3-13n-14w, dry, T.D. 478 ft.

Edwards County

Albion pool: Arrow 1 Stafford, SE NE NE 13-2s-10e, pumped 51 bbl. oil and 75 bbl. water, 5,000 gal. acid, McClosky 3,152-61 ft., T.D. 3,250 ft., plugged back 3,180 ft., lower McClosky pays showed water.
Tuesday 2 Horton, SW NW SE 13-2s-10e, pumped 22 bbl. oil and 30 bbl. water, 4,000 gal. acid, McClosky 3,150-56 ft., T.D. 3,341 ft., plugged back 3,165 ft.
Tuesday 6 G. Works, NW NE SE 13-2s-10e, pumped 250 bbl., 4,000 and 3,000 gal. acid, McClosky 3,114-23 ft., 3,173-77 ft., 3,184-3,212 ft., T.D. 3,212 ft.
Arrow 2 Stafford, SW NE NE 13-2s-10e, dry, McClosky 3,241-47 ft., 3,251-59 ft., T.D. 3,262 ft.
Wildcat: R. Neeley 1 Michael, NW SE NW 8-1s-10e, dry, McClosky 3,294-3,304 ft., T.D. 3,367 ft.

Effingham County

Wildcat: Jarvis Co. 1 L. Reitz, SW SW SE 13-7n-5e, dry, St. Genevieve 2,402 ft., St. Louis 2,551 ft., T.D. 2,704 ft.

Fayette County

Louden pool: Carter 1 L. Dial, SW SE NE 12-8n-3e, pumped 48 bbl., 10-qt. shot, Cypress 1,537-41 ft., T.D. 1,544 ft.
Carter 1 Jefferson Lilly, SE SE SE 17-8n-3e, pumped 43 bbl., 25-qt. shot, Cypress 1,519-40 ft., 20-qt. shot, Paint Creek 1,570-94 ft.
Stewart 3 Rhodes, SW NW SW 26-8n-3e, pumped 12 bbl., 40-qt. shot, Paint Creek Stray 1,568-90 ft., H.F.W., plugged back 1,585 ft., 15-qt. shot, 1,575-85 ft.
Minerva 7 Richardson, NW NE NW 21-7n-3e,, pumped 62 bbl., 40-qt. shot, Cypress sand 1,520-40 ft.
Magnolia 27 T. C. Clow, SW SE NE 5-7n-3e, pumped and flowed 227 bbl., 10-qt. shot, Benoist 1,468-1,507 ft., 40-qt. shot, Cypress 1,450-56 ft.
Luttrell 4 Tucker, SE NW NE 21-7n-3e, dry, Cypress 1,580 ft.
Wildcat: Cherry & Kidd 1 Farber, NE SE SW 5-8n-1w, dry, Glen Dean 1,170 ft., Cypress 1,313 ft., Aux Vases 1,452 ft., Ste. Genevieve 1,523 ft., McClosky 1,596-1,605 ft.

Franklin County

Thompsonville pool: Benedum-Trees 1 Sheppard Martin, SW NE SE 27-7s-4e, swabbed 385 bbl., 2,500 gal. acid, McClosky 3,131-45 ft.
Helmerich & Payne 1 Sanders, SW NW NW 35-7s-4e, pumped 5 bbl. oil and 5 bbl. water, 3,500 gal. acid, McClosky 3,111-14 ft.
Wildcat: Helmerich & Payne 1 P. M. Marvel, NW NW SW 36-7s-4e, dry, T.D. 2,675 ft., plugged back 2,670 ft.

Gallatin County

Wildcat: Carter 1 R. M. York, SE SE SW 33-7s-8e, pumped 255 bbl., oil and 78 bbl. water, T.D. 2,844 ft., P.B. 2,120 ft.. 10-qt. shot, Golconda, P.B. 1,747 ft., P.B. 1,722 ft., 10-qt. shot Palestine, pay 1,701-11 ft.

Greene County

Wildcat: G. Brainerd 1 Bollman, NE NE SW 2-12n-13w, dry, Devonian 167 ft., Trenton 580 ft., H.F.W., T.D. 750 ft.

Hamilton County

Hoodville pool: Exchange 3 Stelle, NW NW SE 27-5s-6e, pumped 160 bbl., 15-qt. shot, Benoist 2,942-68 ft.
Exchange 11 M. E. Friel-A, SE NE SE 34-5s-6e, pumped 85 bbl., 15-qt. shot, Benoist 2,938-62 ft., T.D. 2,963 ft.
Dale pool: Cameron 1 E. Griffin, SW SW SE 31-5s-7e. flowed 780 bbl., McClosky 3,111-22 ft., 3,162-65 ft.
Wildcat: Kingwood 1 McGuire, W½ SW NW 11-5s-7e, dry, McClosky 3,532 ft., T.D. 3,583 ft.

Jasper County

North Boos pool: Pure 1 A. Eckle-A, E½ SW NW 16-6n-10e, dry, 3,000 gal. acid, McClosky 2,783-87 ft., T.D. 2,800 ft.
Pure 2 A. Eckle-A, NE SW NW 16-6n-10e, dry, pumped 1 bbl. oil and 10 bbl. water, McClosky 2,790-92 ft., T.D. 2,840 ft.
West Liberty pool: Pure 1 J. W. Fehrenbacher, E½ SW SW 8-5n-10e, flowed 688 bbl., McClosky 2,811-25 ft., T.D. 2,835 ft.
Wildcat: Forest 1 Swick Cons., NE NE NW 20-8n-10e, dry, 1,000 gal. acid, McClosky 2,583-99 ft., T.D. 2,601 ft.
Schulman Bros. 1 Dial, NE NE NW 18-6n-10e, dry, Ste. Genevieve 2,828 ft., T.D. 2,844 ft.
Pure 1 J. Rohr, W½ NW NW 4-5n-10e, flowed 1,306 bbl., 5,000 gal. acid, flowed 1,345 bbl., natural, McClosky 2,762-71 ft., T.D. 2,797 ft.

Jefferson County

Wildcat: Obering & Phillips 1 A. F. Howe, NE SW SW 25-2s-1e, pumped 60 bbl., 4-qt. shot, Benoist 1,981-88 ft., T.D. 1,990 ft.

Lawrence County

Bridgeport pool: Robinson 2 Warren, SW NW NE 29-3n-12w, pumped 5 bbl., 20-qt. shot, Benoist 1,898-1,925 ft., T.D. 1,935 ft.

Marion County

Salem pool: Texas 66 City of Centralia, SW SE SW 4-1n-2e, pumped 196 bbl., 20-qt. shot, Benoist 1,829-64 ft.

Montgomery County

Wildcat: Sherrer 1 Lyon, SE NE NE 25-10n-5w, dry, T.D. 664 ft.
Top 1 Fisher, NE NE SW 19-9n-3w, dry, elev. 582 ft., T.D. 1,021 ft.

Perry County

Wildcat: Blankenship 1 Bednarkwicz, SW SW NW 24-4s-2w, dry, elev. 518 ft., Menard 10 ft., Waltersburg 755 ft., Vienna 800 ft., Tar Springs 810 ft., Glen Dean 915 ft., Golconda 998 ft., Cypress 1,128 ft., Benoist 1,285 ft., Aux Vases, 360 ft., T.D. 1,381 ft.

Richland County

Dundas pool: Pure 1 Zerkel, W½ SW NW 32-5n-10e, dry, McClosky 2,851-58 ft., T.D. 2,863 ft., P.B. 2,740 ft., tested Aux Vases, perf. 2,287-89 ft., tested Tar Springs 2,287-89 ft.
Pure 1 C. O. Tippet, E½ NE NE 31-5n-10e, dry, McClosky 2,844-48 ft., T.D. 2,853 ft., tested Aux Vases 2,770-89 ft., after P.B. 2,795 ft.
North Noble pool: Pure 2 Dessie Veit, SE SW SW 23-4n-9e, pumped 54 bbl. oil and 16 bbl. water, 30-qt. shot, Cypress 2,600-13 ft., T.D. 2,616 ft.

St. Clair County

Wildcat: Dr. Rose 1 Otten, SE SE NW 28-1n-10w, dry, Trenton 702 ft., T.D. 727 ft.
R. A. Roth 1 Mense, SE SW NE 33-1n-10w, dry, Trenton 804-15 ft.

AVERAGE DAILY PRODUCTION

	Dec. 14	Dec. 7
Salem	119,205	121,045
Louden	68,710	70,165
Other basin fields	127,595	129,635
Old fields	11,725	11,200
Illinois	327,235	332,045

Wabash County

Lancaster pool: Big Chief 1 Seibert, SE SW NW 34-2n-13w, dry, McClosky 2,673-88 ft., 2,500 gal. acid, 30-qt. shot, T.D. 2,713 ft.
Wildcat: Hayes et al 1 Zimmerman, NW NW SE 36-1n-13w, dry, Glen Dean 2,004 ft., Golconda 2,098 ft., Benoist 2,357 ft., Aux Vases 2,433 ft., McClosky 2,544-69 ft., tested Benoist, T.D. 2,580 ft., P.B. 2,365 ft.
Evarts 1 Hahn, NW SE NW 8-1n-13w, dry, 60-qt. shot, Biehl 1,527-45 ft.

Washington County

Irvington pool: Mudge 1 Lansel, SE NE SE 22-1s-1w, pumped 30 bbl., Benoist 1,543-49 ft.
Wildcat: John Pugh 1 Wynn, NW SW SW 33-3s-1w, dry, Menard 820 ft., Tar Springs 916 ft., Glen Dean 1,018 ft., Cypress 1,209 ft., Benoist 2,689 ft., Aux Vases 1,488 ft., Ste. Genevieve 1,545 ft., T.D. 1,671 ft.

Wayne County

Enterprise pool: Pure 1 W. S. Hubble-B, SE SE SW 29-2n-8e, flowed 424 bbl., 5,000 gal. acid, McClosky 3,049-53 ft., T.D. 3,080 ft.
Duncan 4 Skelton, W½ NW NE 32-2n-8e, flowed 312 bbl., 5,000 gal. acid, McClosky 3,008 ft., T.D. 3,086 ft.
Pure 1 W. B. McCracken-B, NW NW SW 3-1n-8e, dry, 5,000 gal. acid, McClosky 3,030-34 ft., T.D. 3,105 ft.
Boyleston pool: O'Meara 2 McLin, NE SW NE 9-2s-7e, pumped 250 bbl., 5,000 gal. acid, McClosky 3,254-57 ft., 3,260-70 ft., 3,274-80 ft., T.D. 3,282 ft.
Barnhill pool: Robinson 6 J. Felix, NE NW NW 35-2s-8e, pumped 58 bbl., 2,000 and 4,000 gal. acid, McClosky 3,384-92 ft., Salem 3,792-3,855 ft.
Clay City pool: Pure 2 R. H. Pierce, E½ NW SW 15-2n-8e, flowed 280 bbl., 5,000 gal. acid, McClosky 3,015-30 ft., T.D. 3,083 ft.

White County

East Calvin pool: Herndon Drlg. 6 J. J. Bond, SE SE NW 8-4s-14w, pumped 65 bbl., 50-qt. shot, Benoist 2,689 ft., Cypress 2,573-90 ft., T.D. 2,745 ft., P.B. 2,634 ft.
Herndon Drlg. 1 A. Garrison, NW SW NE 8-4s-14w, pumped 15 bbl., 60-qt. shot, Paint Creek sand 2,676-2,715 ft., 30-qt. shot, Cypress 2,602-20 ft., T.D. 2,720 ft., P.B. 2,623 ft.
D. & H. Drlg. 1-C F. M. Hon, NW SE SW 9-4s-14w, flowed 250 bbl., 30-qt. shot, Aux Vases 2,821-44 ft.
Burr Lambert 6 G. P. Caivin, NW NE SW 9-4s-14w, pumped 35 bbl., 70-qt. shot, Aux Vases 2,816-41 ft.
Bryan 1 Bramlett-A, NE SW SE 17-4s-14w, flowed 274 bbl., 30-qt. shot, Cypress 2,570-93 ft.
Bryan 3 Bramlett-A, SW SW SE 17-4s-14w, flowed 275 bbl., 15-qt. shot, Cypress 2,590-98 ft.
Bryan 4 Bramlett-A, NW SW SE 17-4s-14w, flowed 270 bbl., 15-qt. shot, Cypress 2,575 ft., T.D. 2,595 ft.

P. E. Tipton 2 T. E. Boltinghouse, SW SE NE 17-4s-14w, flowed 244 bbl., 80-qt. shot, Paint Creek 2,665-78 ft., Benoist 2,692-2,708 ft.
K. Youst et al 2 Bramlett, SW NW SE 17-4s-14w, pumped 120 bbl., 14-qt. shot, Benoist 2,698-2,730 ft.
Cherry & Kidd 3 W. W. Gray-E, NW NE NW 17-4s-14w, pumped 90 bbl., 80-qt. shot, Benoist 2,710-39 ft.
J. H. Ligget 2 F. M. Hon, SE NW SE 32-3s-14w, pumped 265 bbl., 100-qt. shot, Paint Creek 2,740-50 ft., and Benoist 2,760-77 ft., T.D. 2,779 ft.
Griffin pool: W. W. Gray 11 Fee, SW NW SE 14-3s-14w, flowed 600 bbl., 30-qt. shot, Cypress 2,500-26 ft.
South Griffin pool: Longhorn 5 E. Helm, NW SE NE 27-3s-14w, pumped 125 bbl., 30-qt. shot, Cypress 2,504-14 ft. and 2,560-89 ft., T.D. 2,590 ft.
North New Harmony pool: Superior 9 H. C. Ford et al-C, SW SE SW 27-4s-14w, flowed 125 bbl., 5,000 gal. acid, McClosky 2,876-88 ft., 2,944-54 ft., T.D. 2,960 ft.
New Harmony pool: Superior 2 H. C. Ford et al-D, SW NW NW 34-4s-14w, pumped 210 bbl., 6,000 gal. acid, McClosky 2,876-2,902 ft., Aux Vases 2,802-32 ft., Benoist 2,689-2,730 ft., Cypress 2,562-92 ft., Waltersburg 2,114-26 ft.
Storms pool: Exchange-Ohio 12 S. A. Pierce, NW SW NW 12-6s-9e, pumped 100 bbl., 5-qt. shot, Waltersburg 2,266-9 ft.
Smokey 2 Wilson, NW NW SE 11-6s-9e, pumped 85 bbl. oil and 11 bbl. water, 40-qt. shot, Waltersburg 2,264-80 ft., T.D. 2,283 ft.
Wildcat: Patton-Cary 1 Reeves Heirs, NW NW SE 28-3s-14w, pumped 138 bbl., Cypress sand 2,550-62 ft., 2,598-2,614 ft. (best.)
Mazda & Palmer 1 L. Storms, N½ SW SE 26-5s-9e, pumped 65 bbl. oil and 64 bbl. water, Base Penn. 1,929 ft., lower Kincaid 2,044 ft., Deonia 2,067 ft., Menard 2,272 ft., Waltersburg 2,367 ft., Vienna 2,-415 ft., Tar Springs 2,429 ft., Glen Dean 2,522 ft., Hardinsburg 2,565 ft., Golconda 2,621 ft., Barlow 2,736 ft., Cypress 2,741 ft., Paint Creek 2,808 ft., Benoist 2,915 ft., Aux Vases 3,004-26 ft., Ste. Genevieve 3,068 ft., Rosiclare 3,076 ft., Fredonia 3,089 ft., McClosky 3,132 ft., T.D. 3,167 ft., P.B. 3,160 ft., 1,000, 3,000 and 4,000 gal. acid, McClosky 3,132-46 ft. and 3,158-64 ft.
Bradley 1 C. Randolph, NE NE SE 32-6s-9e, dry, Base Penn. 2,076 ft., Clore 2,196 ft., Palestine 2,-205 ft., Menard 2,280 ft., Waltersburg 2,345 ft., Vienna 2,415 ft., Tar Springs 2,445 ft., Golconda 2,610 ft., Barlow 2,739 ft., Paint Creek 2,880 ft., Benoist 2,890 ft., Renault 2,970 ft., Aux Vases 2,-995 ft., Ste. Genevieve 3,005 ft., Rosiclare 3,033 ft., 1,000 gal. acid and 40-qt. shot 3,036-49 ft., also tested Benoist 2,409-24 ft., T.D. 3,153 ft., P.B. 3,-049½ ft.

ILLINOIS DRILLING REPORT

Bond County

J. B. Barnes 1 Watts.....NE SW NE 7-5n-2w Devonian 2,410 ft., S.D. 2,465 ft.
J. Harding 1 Gottfried.....NE NW NE 28-5n-4w T.D. 930 ft., P.B. 639 ft., bailing show in Pennsylvanian sand.

Clark County

Sherritt et al 1 Jeffers.....SE NE SE 31-11n-13w Drilling 350 ft.

Clinton County

C. Bell 1 Maibaum.....NE NE SE 12-3n-3w Benoist 1,152-59 ft., show oil, milling casing.
D. S. Parshall 1 Dixon.....SE SW NE 6-3n-2w Spudded.
Williams & Lyman 1 Thomas est. SW NE NW 24-2n-1w Drilling 1,445 ft.
Hughes 2 Holman.....NE SW SE 10-2n-1w Drilling 90 ft.

Edwards County

J. D. Barnes 1 Hodgson.....N½ NE 1-2s-10e Menard 2,355 ft., Waltersburg 2,383 ft., fishing 2,900 ft.
Dee Brothers et al 1 Stewart....SW SW SW 12-1s-10e Rig.

Fayette County

Turner 1 Pruett.....SE SW NW 7-5n-3e Drilling 1,810 ft.
Kingwood 1 Dayton.....E½ NW SE 14-6n-1w Glen Dean 1,108 ft., Benoist 1,409 ft., drilling 1,455 ft., elev. 538 ft.

Franklin County

Vanderbark 1 U. S. Guaranty.....NW SW SE 34-7s-4e Spudded.
E. S. Adkins 1 Orient Coal Co.... NE SW SE 24-6s-2e T.D. 3,645 ft., P.B. 2,150 ft., Tar Springs 2,111-67 ft., S.D.

Gallatin County

Cameron 2 Robinson.....SE NW NW 4-8s-8e Drilling 1,100 ft.

Hancock County

Sam Tate et al 1 J. Rice.....SW NE NW 28-4n-5w St. Peter 942 ft., drilling 1,325 ft., corrected.

Jackson County

W. R. White 1 Dean.....NE NW NW 18-9s-3w T.D. 1,230 ft., 7-in. at 1,143 ft., P.B. 1,183 ft., drilled out to 1,213 ft., Salem pay 1,206-13 ft., 500 gal. acid, cleaning out, may put on pump.
Barton & Shipmen 1 P. Maharry..NE NE SE 20-9s-3w S.D. 318 ft.
Magnolia 1 Smith heirs.....SE SE NE 9-8s-3w Elev. 669 ft., Menard 475 ft., Tar Springs 617 ft., Glen Dean 762 ft., Golconda 800 ft., Cypress sand 860 ft., Benoist 1,096 ft., Aux Vases 1,167 ft., Ste. Genevieve 1,297 ft., St. Louis 1,510 ft., drilling 1,515 ft.

Jefferson County

Vawter 1 Modglin.....NW SE SW 9-1s-1e Drilling 2,335 ft., Glen Dean 1,542 ft., Benoist 2,077 ft.

Madison County

F. C. Kiskadden 1 G. A. Fisher SE SW NE 27-5n-8w Drilling 320 ft.

Marion County

Martin et al 1 Robinson.....SW SE SW 4-2n-1e Trenton 4,268 ft., Decorah 4,397 ft., Plattin 4,417 ft., drilling 4,802 ft.
Paul Rossi 8 Brooks.....SW NE SW 29-2n-2e Fishing 4,030 ft.

Macoupin County

Bridges & Valbert 1 Feiker.....NW NE SW 1-9n-7w Drilling 720 ft.

McDonough County

Vancroft & Bowman 1 W. A. Murray..... NW SE SE 8-5n-4w Fishing 620 ft.

McLean County

Funks Grove O. & G. 1 Crawford..... NW NW NW 28-22n-1e Running casing 898 ft.

Montgomery County

Ginsberg et al 1 McDenver.....SW NE SE 14-7n-2w Show gas 444-47 ft., fishing 625 ft.

Pope County

L. V. Garvier 1 Peoples.....NE NE NE 30-11s-5e Kincaid 603 ft., Degonia 825 ft., Clore 860 ft., Pasestine 970 ft., drilling 1,150 ft.

Randolph County

J. R. Rankin 1 B. Bierman.....SW SW SE 3-7s-5w Drilling 445 ft.

Shelby County

D. C. Brunswold 1 Harley-Vantis SW NW NW 36-13n-3e Elev. 673 ft., Golconda 1,510 ft., Benoist 1,699 ft., S.D. 1,709 ft.
J. Moore et al 1 fee.....SW SW NE 30-10n-3e Show gas 1,185-87 ft., drilling 1,278 ft.
Rose & Durbin 1 Flenner.....SW SW SE 9-10n-4e Glen Dean 1,292 ft., Renault 1,550 ft., S.D. 1,702 ft.
Burr Lambert 1 Bucholz.....SE SW NE 9-2s-13w Drilling 1,450 ft.

Washington County

De Kalb et al 3 Hunleth.....SW NE NW 29-3s-4w Menard 558 ft., Glen Dean 654 ft., Benoist 982 ft., Ste. Genevieve 1,108 ft., T.D. 1,186 ft., pumped 100 bbl. oil and 60 bbl. water in 15 hr., 1,007-13 ft. and 1,028-36 ft., then went to water, pulling rods and tubing.

Wayne County

Pure 1 G. Flexler.....E½ SE SE 35-1n-7e Glen Dean 2,472 ft., Hardinsburg 2,487 ft., drilling 2,706 ft.

White County

O. O. Borden 1 I. McCallister....NE SE NE 7-5s-14w Pumped 60 bbl. an hr., 2,911 ft., testing.
H. R. Rhodes 1 H. R. Golder....SW SE NE 29-5s-14w Moving in rotary.
French & Cotton 1 May Roy....S½ NW NW 30-3s-9e T.D. 1,350 ft., cementing casing.
Yingling et al 1 Ford heirs.....SE NE SW 22-4s-14w Kincaid 1,849 ft., Cypress sand 2,612 ft., S.D. 2,625 ft.
Eason 1 DeLaff.....NE SW NW 8-7s-8e Set 10-in. 108 ft.
Duncan 1 Zeller.....SE NE NE 34-3s-8e Cypress 2,881 ft., Benoist 3,042 ft., S.D. 3,087 ft.

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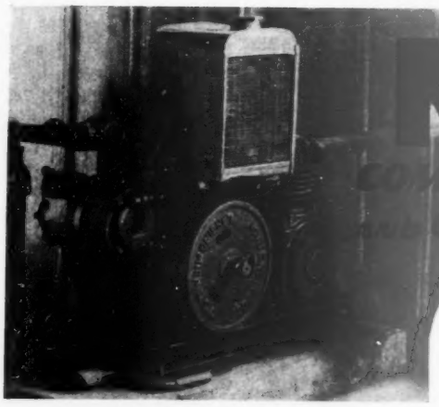

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HD-40	3x4	7.15	200	1.7	Air	2.75 Min.	275
HD-41	3x4	9.3	200	2.27	Air	1.93 Min.	325
HD-95	4½x2½-3¾	16.27	350	5.12	Water	1.69 Min.	495

*HP on gas operation

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LOUISIANA GULF COAST

Intermediate Sand Found in Faulted Block at Iowa

By F. L. SINGLETON

NEW ORLEANS, La., Dec. 16.—The opening of commercial production from a new sand in the Iowa field, Calcasieu and Jefferson Davis parishes, featured developments along the Louisiana Gulf Coast the past week. The discovery was made by Shell 32 Heyd which was completed for an initial production of 356 bbl. of 47.1-gravity oil per day through a ¼-in. choke. Tubing pressure was 256 lb., and casing pressure 2,750 lb. The well has been in the process of completion for several weeks. It was drilled to a total depth of 9,300 ft., and final completion was made by perforating casing at 7,570-73 ft. which is several hundred feet higher than the newly opened 8,200-ft. pay, the discovery of which has led to a revival of drilling activity. The well is located in 13-9s-7w in approximately the center of the field, and the new-sand discovery is apparently due to faulting inasmuch as drill-stem testing in the 8,200-ft. sand failed. On the Jefferson Davis Parish side of the field in 7-9s-6w, a slight west extension to the 8,200-ft. sand was indicated as Shell 4 Fontenot was running 5-in. liner to complete after drill-stem testing at 8,212-20 ft. recovered pipe-line oil.

Location for an interesting wildcat test was announced for St. Martin Parish by Shell Oil Co., Inc., for 1 State, Duck Lake, in 1-15s-11e. The company controls a block of several thousand acres which was leased on the strength of geophysical work.

SUMMARY OF COMPLETIONS

Louisiana Gulf Coast

	No.	Prod.	Footage
Oil wells: New Iberia	1	68	6,625
Other fields	8	3,377	62,033
Dry holes: Fields	3	.....	5,846
Wildcats	2	.....	20,666
Total	14	.....	95,170

Ritchie Development

Additional development in the shallow Ritchie field, Acadia Parish, is anticipated following the completion of H. L. Carnahan 1-B McManus as the first commercial producer in the field. The well was completed in sand at 3,515-25 ft., the total depth, and it flowed 150 bbl. of 26-gravity oil per day through a ¼-in choke. The discovery well, Vincent, Welch et al 1 McManus, was originally completed as small producer in the same sand, but was later worked over due to salt-water encroachment and recompleted as a gas well. Location is in 21-7s-1w. The same operator is moving in material for an offset to the new producer.

South Crowley Opener

Humble 1 Freeland, completed the previous week to open a new sand in the South Crowley field, Acadia Parish, flowed 75 bbl. of pipe-line oil per day through a ⅛-in. choke from perforated casing at 7,093-97 ft. The rig is being moved to 2 Leger, a recent completion which is said to be showing considerable salt water, and the well is scheduled to be recompleted.

In the Woodlawn field, Jefferson Davis Parish, Union Sulphur Co. is preparing to test 3 Edith Norton. The well was drilled to a total depth of 9,375 ft., and the production test is slated to be made at 9,290-96 ft.

Drilling operations on W. P. Luse and J. P. McAdams 1 Peyregne, 2 miles south of the Paradis field, St. Charles Parish, has been halted at 11,280 ft., and the well is expected to be abandoned. No shows have been reported, and the well is reported to be approximately 1,000 ft. lower than Texas 1 Paradis located in the field proper.

LOUISIANA GULF COAST COMPLETIONS

Acadia Parish

North Crowley field: Humble 4 Reiners, 720 bbl., ¼-in. choke, perf. casing 8,787-92 ft., T.D. 8,805 ft.

Ascension Parish

Darrow field: Humble 31 Community, 355 bbl., ¼-in. choke, T.D. 4,680 ft.

Calcasieu Parish

Sulphur field: Union Sulphur Co., 873 fee, 224 bbl., ⅞-in. choke, perf. casing 6,225-55 ft., T.D. 6,350 ft.

Cameron Parish

Wildcat: Superior 4 State-Calcasieu Lake dome, dry, T.D. 8,664 ft.

Evangeline Parish

Ville Platte field: Continental 6 N. H. Hirsch, 99 bbl., ⅞-in. choke, T.D. 10,180 ft.

East Baton Rouge Parish

University field: Superior 1 Hatfield-Community, 172 bbl., 10/64-in. choke, perf. casing 6,802½-06½ ft., T.D. 7,242 ft.

Iberia Parish

Fausse Point field: Sun 4 Planters, dry, T.D. 1,769 ft.
New Iberia field: William Helis 4-A Bullock, 680 bbl., ¼-in. choke, perf. casing 6,240-6,300 ft., T.D. 6,625 ft.

Jefferson Davis Parish

Woodlawn field: Union Sulphur Co. 1 Romero, 76 bbl., 10/64-in. choke, perf. casing 9,540 ft., T.D. 9,571 ft.

St. Charles Parish

Paradis field: Texas 7 Paradis, 843 bbl., ¼-in. choke, perf. casing 10,308-31 ft., T.D. 10,430 ft.

St. Mary Parish

Charenton field: Pan American 8 South Coast Corp., dry, T.D. 2,807 ft.

St. Martin Parish

Anse La Butte field: Stanolind 2 Bergeron, 176 bbl., 5/32-in. choke, perf. casing 4,670-4,700 ft., T.D. 4,775 ft.

Terrebonne Parish

Wildcat: Stanolind 1 State, Bay Junop dome, dry, T.D. 11,002 ft.
Bay St. Elaine field: Jefferson Lake Sulphur Co. 6 Salt Dome Royalties, dry, T.D. 1,270 ft.

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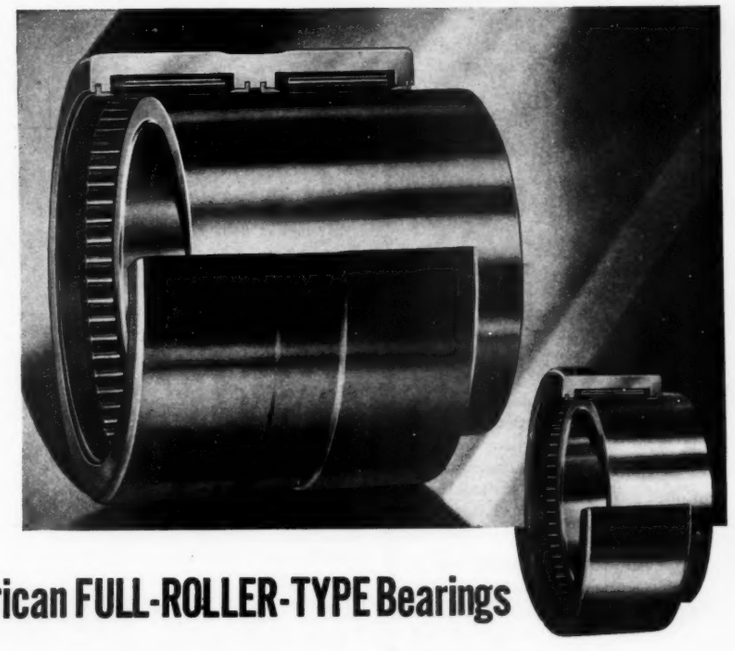

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EASTERN TEXAS FIELDS

Eleven New Tests Announced For Hawkins Woodbine Area

By R. MARNE SANFORD

DALLAS, Tex., Dec. 16.—A decided upturn of activity in the Hawkins area of Wood County was noted at the close of the past week when 11 new tests were planned for the recently opened field by Bobby Manziel just 2 miles north of the town of Hawkins. There are three tests active in the area at present and with the new tests planned the total operations for the new field are pushed to 14.

At the close of the week Bobby Manziel spudded 1 Lee Bell, Wideman Survey, to give the area three active operations. In the townsite of Hawkins, Rotondi 1 Cobb, Brewer Survey, is drilling below 3,085 ft. toward the Woodbine sand found in the discovery well for the field.

Somewhat out of the active Hawkins area but still in Wood County, Sells Petroleum 1 Beckham, Cowan Survey, 6 miles northeast of Mineola, is drilling below 1,960 ft. toward a 7,500-ft. Travis Peak contract.

In the immediate area of Hawkins, Bobby Manziel plans five additional tests. His 1 Payne has been located in the Esparcia Survey. The 2 and 3 Lee Bell and 2 and 3 Morrison have been staked. Site for 3 Bell is 285 ft. from the west line and midway between the north and south lines of the Bell tract, while the 2 Bell will be between No. 1 and No. 3. Location for 2 Morrison will be 330 ft. from the north and east lines of the 65-acre Morrison tract, while No. 3 will be 860 ft. from the east line and midway between the north and south lines. Four permits are being sought by O. O. Goldsmith for tests on the F. M. Farmer lease, while T. C. Chadwick is seeking permit to drill on the E. S. Blackstone tract. Another permit has been granted H. H. Knox of Kilgore for 1 Lynch, in the Brewer Survey, on the division lines of Lots 18 and 19.

SUMMARY OF COMPLETIONS

East Texas Field

	No.	Prod.	Footage
Oil wells	10	*445	35,847
Service wells†	1	.....	3,848
Total	11	.....	39,695

Eastern Texas

Oil wells: Fields	4	1,100	17,965
Dry holes: Fields	2	.....	6,031
Wildcat	1	.....	4,500
Total	7	.....	28,496

*Per hour. †Salt-water disposal.

New Wildcats in District

Rains County was given its long-promised wildcat by Plains Production Co. of Dallas. It is to be I W. D. Foster, 467 ft. from the north and east lines of an 81-acre tract in the T. Cummings Survey. The location is about a mile west and north of Alba and on a block of 5,000 acres along the Rains and Wood county line. The contract depth is set as the Woodbine sand.

The Whitehouse community of Smith County was given a new 4,055-ft. Woodbine sand wildcat when O. L. Ross and associates of Beaumont staked 1 C. H. Willingham, 64-acre tract in the Jacob Harrin Survey. It is about 8 miles southeast of Tyler and about 6 miles southwest of the Chapel Hill field.

EAST CENTRAL TEXAS COMPLETIONS

Anderson County

Long Lake field: Pyle & Springer 1 Reagan, 176 bbl., 80,000,000 cu. ft. gas, 5,358-66 ft.

Franklin County

Talco field: Talco Asphalt & Refg. 2 Rutherford, 168 bbl. in 4 hr., pumping, 4,257-95 ft.
Texas Co. 20 Barker, 84 bbl., flowing, open tubing, 4,140-4,278 ft.

Freestone County

Wildcat: Collins & Utley, J. S. Claypool Survey, 7 mi. N of Fairfield, dry at 4,506 ft. (old well retested).
Cayuga field: Tide Water-Seaboard 3 Moody, 192 bbl., ⅛-in. choke, 3,930-4,026 ft.

Navarro County

Old Richland field: C. E. Brown 1 Taylor, dry at 3,021 ft.
C. E. Brown 2 Taylor, abandoned location.
Speed Oil 1 Swink, dry at 3,010 ft.

EAST TEXAS FIELD COMPLETIONS

(One-hour gages)

Gregg County

Longview area: J. Wrather 2 Tubb, 120 bbl., in 6 hr., tubing, 3,592-93 ft.
The Pet. Corp. 15 L. M. Colburn, 60 bbl., tubing, 3,515-89 ft.
Peyton Bros. 5 Jones, 210 bbl., in 3 hrs., tubing, 3,561-75 ft.
Sklar Oil 6 Alexander, 40 bbl., tubing, 3,552-74 ft.
M. E. Trapp 2 Anderson-Crip, 60 bbl., tubing, 3,505-51 ft.
Kilgore area: Hamil & Smith 6 Culp, 40 bbl. in 50 min., tubing, 3,538-72 ft.
Hamil & Smith 5 Hughey, 30 bbl., tubing, 3,552-67 ft.
Hamil & Smith 6 Knowles, 36 bbl., tubing, 3,541-42 ft.
Overton Refg. 20-B I.&G.N. R.R., 200 bbl. in 5 hr., tubing, 3,540-63 ft.
Sinclair Prairie 5 H. J. Thomas, salt water disposal well at total depth of 3,848 ft.

Rusk County

Kilgore area: H. L. Swindler 11 Mayfield Gro., 35 bbl., tubing, 3,720-21 ft.

EASTERN TEXAS DRILLING REPORT

Fannin County

Damon Oil 1 A. L. Chaffin, SW cor. 85-acre tract, J. Ketcham Sur., 4 mi. NE Bonham, location cleared, prepare move in materials.

Kaufman County

T. G. Shaw, trustee, 1 Agnes Wynne, B. S. Newman Sur., 8 mi. E of Kaufman, lower Trinity test, S.D. for high water 6,454 ft.

McLennan County

E. P. Campbell 1 Stewart, S. Burton Sur., 5 mi. N of Waco, drilling 630 ft.

Limestone County

Farrell Drlg. and Gulf Oil 1 F. Bevill, J. H. Murray Sur., 1 mi. SW of Horn, Travis Peak 4,892 ft., S.D. 4,937 ft., curing titles.
Hardin & Ames 1 Hammond, J. Folk Sur., 1½-mi. NW of Kosse, top Austin 2,765 ft.; Woodbine 3,210 ft.; Buda 3,359 ft.; Georgetown 3,490 ft.; Paluxy 4,220 ft.; Glen Rose 4,290 ft.; anhydrite 5,190 ft.; Pettit 5,693 ft.; drilling at 5,734 ft. in lime.

Wood County

Bobby Manziel 1 F. M. Morrison, James Pollock Sur., 4 mi. N of Hawkins, 10-in. at 10 ft., top Woodbine sand at 4,902 ft., saturated from 4,902-20 ft., well checks 300 ft. high, 5½-in. at 4,898 ft., 15 bbl. of 28-gravity oil recovered on initial tests, P.B. 4,894 ft. and drilled out to 4,908 ft., let stand 12 hr. and salt water rose 800 ft. in hole, drilled out to 4,925 ft. and made 85 per cent water and 15 per cent oil, water believed coming from upper part of pay level, still testing, T.D. 4,962 ft., P.B. 4,925 ft., drilled out to 4,917 ft.; perf. 4,909-15 ft.; swabbed down 2,000 ft., pumped 20 bbl. fluid per hour, 75% SW and 25% oil.
Bobby Manziel 1 M. Carter, 31-acre tract on E side of Wideman Sur., ¾ mi. NW of Hawkins townsite, location.
Jackson & Rotondi 1 Cobb, Geo. Brewer Sur., in the Hawkins townsite, top Navarro 2,414 ft.; Nacotoch 2,245 ft., drilling 2,490 ft.
Delta Drlg. Co. and Sells Pet. 1 Beckham, G. W. Cowan Sur., 4½ mi. NE of Mineola, S.D. to cure titles at 1,448 ft.

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MICHIGAN OPERATIONS

Preparing to Go Ahead With Deep Bay County Test

By OTTO C. PRESSPRICH

SAGINAW, Mich., Dec. 16.—Gulf Refining Co.'s announcement last week that it was ordering $125,000 worth of new equipment to continue drilling operations at its 1 Bateson deep test in Monitor Township, Bay County, was viewed as having special significance to Michigan.

The test was the scene of a spectacular explosion last December 5 and a resulting fire than blazed for 2 days before a Texas fire-fighting crew, imported for the occasion, snuffed the flame with an explosive. The fire caused $65,000 damage to rigging and other equipment. Early last week, after being capped, accumulated pressure forced the fittings, operators solving that problem by running an auxiliary 3-in. pipe to the hole, thus relieving pressure enough to permit resumption of activity.

Geologists considered the possibility that the gas discovery may indicate huge deposits hitherto unsuspected in Michigan and the fact that traces of oil were noted after the fire was put out also may be significant. The explosion occurred with the test at a depth of 7,776 ft. Gulf's intention is to proceed to 9,000 ft. or deeper.

Summarizing the reaction of oil and gas men and geologists, F. R. Frye, state petroleum engineer, last week said the industry is "agog" over the implications. Pointing out that the gas was found in rock salt, first such condition reported in the state, he declared, "It's very unusual. You'd think rock salt would be the last place in the world for natural gas."

He added that gas had been located some years ago below rock salt beds in this state, but not within the bed itself. The Bateson test now is in what are believed to be the thickest salt beds in Michigan, one of the large salt-producing centers of the world.

While estimates were that the gas flow was at the rate of 12,000,000 cu. ft. a day, there was no adequate gauge of the flow and some sources declared the volume probably was three or four times greater.

Lester Lefavor, a Gulf superintendent, said the new equipment, including a 136-ft. steel derrick, had been ordered from Parkersburg, W. Va., but that it would not be possible to resume drilling operations until about January 1.

Elsewhere in Michigan the lull in oil activity continues. The week saw 15 completions, all but two being dry holes. Failures included another operation in the Adams-Arenac district, as well as tests scattered generally through the basin area. There was completed a 100-bbl. well in Kent's Walker field, but the other, rating only 6 bbl., was in Van Buren County, where four of the dry holes were listed.

SUMMARY OF COMPLETIONS

	No.	Prod.*	Footage
Oil wells: Kent County	1	100	1,920
Van Buren County	1	6	1,191
Dry holes: Van Buren County	4	.....	5,105
Others	9	.....	23,622
Total	15	.....	31,838

*Barrels.

MICHIGAN COMPLETIONS

Allegan County

Salem Township: Lillie & Johnson 1 Kipen, NW SE NW 23-4n-13w, dry, T.D. 1,604 ft.

Arenac County

Adams Township: D. Shiffman 1 Crawford, SE SE NE 17-19n-3e, dry, T.D. 3,111 ft.

Gratiot County

North Shade Township: Chartiers Oil Co. 1 Wagner, NE NE SW 2-9n-4w, dry, T.D. 3,215 ft.

Huron County

Bloomfield Township: Cryden Petroleum Co. 1 Sommers, SW SW NW 21-17n-14e, dry, T.D. 1,454 ft.

Ingham County

Meridian Township: Kalavan Drillers 1 Schubel, SE NW SE 23-4n-1w, dry, T.D. 2,770 ft.

Isabella County

Wise Township: W. E. Ross 1 Worden, NW SE NE 8-16n-3w, gas test, dry, T.D. 1,279 ft.

Kent County

Walker Township: W. H. Clock 1 Kniff, SW NE SE 29-7n-12w, 100 bbl., acid, T.D. 1,920 ft.

Missaukee County

Clam Union Township: Rowmor and Ohio 1 State, S½ SW SW 16-21n-6w, dry, T.D. 3,928 ft.

Montcalm County

Crystal Township: C. M. Corthurs 1 Rice, N½ SW SW 21-10n-5w, dry, T.D. 3,243 ft.

Ogemaw County

Foster Township: Gulf 1 Garber, W½ SW SW 8-24n-1e, dry, T.D. 3,018 ft.

Van Buren County

Bloomingdale Township: W. R. Borough 1 Wait, SW SW SE 10-1s-14w, dry, T.D. 1,335 ft.
F. Gouin 1 Grant, NW SE NE 15-1s-14w, dry, T.D. 1,286 ft.
Clapsaddle & Harris 1 Draheim, NE SE NE 16-1s-14w, dry, T.D. 1,295 ft.
Columbia Township: Miller Bros. 1 Landrus, SW NW NW 11-1s-15w, 6 bbl., acid, T.D. 1,191 ft.
Allegan Pipe & Supply Co. 1 Reynolds, NW NW SW 16-15-15w, dry, T.D. 1,189 ft.

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MISSISSIPPI AND SOUTHEAST

Northeast Limit of Tinsley Found in Both Sands

By GEORGE WEBER

JACKSON, Miss., Dec. 16.—The failure of a northeast edge test at Tinsley last week gave that field its first setback in many months. The testing of salt water in both the Perry and Woodruff sands of the field did not come as a complete surprise, but it apparently precludes the extension of the large field to the northeast, and further detracts from interest in the north end of the field.

The southeastern extension area of Tinsley, where new producers have extended the field limits close to the northwest-southeast fault, beyond which lie two failures drilled several months ago by Whigate Oil Co. The Woodruff sand has shown its usual thickening characteristics away from the area in the field where it is missing, and good wells are being completed, with indications for much productive acreage south of present operations.

Wildcatting

Elsewhere in the state, little of interest resulted from activity of several wildcats. No new locations nor abandonments of tests were reported outside Tinsley. In Copiah County, the deepening of the G. C. Koch 1 Broome in the Wesson district is expected to begin shortly after the first of the year. The wildcat was temporarily abandoned at 3,628 ft. and will be carried to 5,000 ft.

Fohs Oil Co. 1 Batson-Hatten, Forrest County wildcat in the coastal part of the state, is encountering difficulty at 2,000 ft. Circulation was lost at that approximate depth, and operators plugged back to 1,970 ft. and sidetracked only, it is reported, to lose circulation again when they approached the same depth.

Interest in the Kemper County wildcat, R. J. Dean 1 Land has waned this week. Last week, operators noted a drilling break at 2,050 ft. in the top of the Eutaw formation. During the drilling of the next 4 ft., a scum of oil showed on the pit, and a show of gas was reported. Coring from 2,054-80 ft., however, failed to recover anything but porous sand with no taste or odor. Since that time operators have attempted to run an electrical log, but cannot get on bottom.

In Tishomingo County, Mellon & Gear 1 Wood, a shallow wildcat drilling on the west flank of the Bear Creek structure, has resumed drilling after several weeks' shutdown. A slight show of gas was encountered at 807-19 ft. and another similar show is reported at present drilling depth of 860 ft., in the Trenton lime topped at 807 ft.

The Davis Island test, Barker & Brander 1 Parker, in Warren County, has been taken over by Waggoner Brothers Oil Co., who will begin shortly, according to reports. This prospect showed oil in a test drilled several years ago, and interest has continued in the area since the revival of drilling in the state.

SUMMARY OF COMPLETIONS

	No.	Bbl.	Footage
Oil well: Tinsley	1	751	4,963
Dry hole: Tinsley	1	...	5,386
Total	2	...	10,349

AVERAGE DAILY PRODUCTION

Tinsley	12,245
Pickens	1,110
Total Mississippi	13,355

COMPLETIONS

Tinsley—Yazoo County

Barnsdall 1 T. R. Woodruff, NW NW 6-10-2, T.D. 5,386 ft., salt water in Perry and Woodruff sands, abandoned.

Union Producing Co. 5 Childress, SE SE 19-10-2, 751 bbl., 16/64-in. choke, C.P. 200 lb., T.P. 135 lb., Woodruff sand 4,873-4,963 ft., 7-in. casing 4,975 ft., perf. 4,935-57 ft.

MISSISSIPPI DRILLING REPORT

Bolivar County

E. S. Holmans 1 E. K. Thomas, NE NE 18-24n-7w, drilling 2,685 ft.

Clarke County

Walsingham & Earles 1 School Land, SW NW NE 16-4n-15e, drilling 2,277 ft.

Forrest County

Fohs Oil Co. 1 Batson-Hatton, NW SE 10-1s-12w, P.B. 1,970 ft. and sidetracked, lost circulation at 2,000 ft.

Grenada County

James Papadakis 1 Holcomb, SE NE 13-22n-2e, S.D. 3,797 ft., stuck D.S. 3,511 ft., lubricating with oil, failed to loosen.

Hinds County

Sanford & Sellers 1 Sellers, NE SE SE 23-6n-1e, S.D. 610 ft.

Kemper County

R. J. Dean et al 1 Land, NW NE 12-10n-14e, show scum of oil on pit while drilling to 2,054 ft., cored 2,054-80 ft., recovered sand, no show, cannot get on bottom to run electrical log.

Lee County

R. L. Shoemaker 1 Martin, SW SW NE 33-9s-6e, fishing 950 ft.

Madison County

Higgason & Dills 1 Higgason, SE SW 8-11n-5e, prepare to spud.

Marshall County

C. B. Blosser 1 C. Stansback, SE SE 19-3s-4w, no report, 701 ft.

Noxubee County

Hope & Thompson 1 Donahoo, NW 25-16n-17e. drlg. sh. 1,963 ft.

Sharkey County

British American 1 F. B. Houston est., N½ NE SW 23-11n-7w, T.D. 4,027 ft., fishing for 400 ft. D.S.

Tishomingo County

Mellen & Gear 1 E. K. Wood, SE SE SE 21-4s-11e, drilling lime 867 ft., slight show gas 807-19 ft.

Warren County

Waggoner Bros. Oil Co. (former Barker & Brander 1 Parker, NW NW 17-14n-1e, moving in material.

ALABAMA DRILLING REPORT

Madison County

W. W. Newman 3 Nichols, NE NW NE 2-6s-2e, stuck casing and lost two joints, prep. rip.

Walker County

Champlin Oil & Ref. Co. 1 Galloway Coal Co., 12-13s-10w, T.D. 4,183 ft., tried to pull stuck 8-in. casing, cut at 2,215 ft., reset at 2,170 ft., prep. acidize with 2,000 gal. at 2,188-93 ft., porous lime, show dead oil and est. 200,000 cu. ft. gas.

Homer Repressuring Program Is Extending Productive Life

The Homer field is the most prolific oil producer to date in North Louisiana, having produced over 70 million barrels of crude since its discovery in 1919. Early unrestricted flow soon dissipated the reservoir pressure, however, and the section north of the fault has been incorporated into a repressuring program. From a total of 246 wells in that section, producing 1,241 acres, production has been increased by 380 bbl. daily over what it would have averaged under ordinary production methods.

From the beginning of the cooperative program in September 1937 to October 1940 an additional 309,540 bbl. have been produced, and the net gain to operators has been $195,100, averaging at present a gain of $8.832 monthly.

Rocky Mountain Runs

Average daily production for week ended December 14:

WYOMING

	Barrels
Salt Creek	13,780
Big Muddy	1,170
Badger Basin	240
Black Mountain	100
Byron	3,950
Cody Dome	60
Cole Creek	750
Dallas Derby	650
Dutton Creek	60
East Mahoney—Ferris	90
Elk Basin	420
Frannie	2,790
Garland	1,950
Grass Creek	1,070
Hidden Dome	70
Hudson	230
Iron Creek	10
La Barge	1,780
Lance Creek	25,520
Lost Soldier	1,400
Mahoney	1,120
Medicine Bow	710
Mule Creek	170
Oregon Basin	5,600
Osage	600
Poison Spider	240
Quealy Dome	450
Rock River	2,530
Teapot	20
Warm Springs	70
Wertz	400
Total Wyoming	68,000

MONTANA

Kevin-Sunburst	4,940
Border	20
Cat Creek	430
Cut Bank	11,860
Dry Creek	10
Pondera	900
Total Montana	18,160

COLORADO

Iles Dome	1,630
Florence	130
Fort Collins and Wellington	320
Wilson Creek	590
Moffat	370
Greasewood	20
Rangely	90
Tow Creek	140
Price	230
Total Colorado	3,520

NEW MEXICO

Arrowhead	3,310
Cooper	2,800
Corbin	70
Eaves	640
West Eunice	320
Eunice	16,500
Halfway	220
Hardy	2,960
Hobbs	8,990
Jal	420
Langlie	3,910
Lynch	370
Lynn	880
Mattix	4,450
Monument	17,270
North Lynch	30
Penrose	4,660
Rhoades	250
Skaggs	70
Skelly	1,870
South Eunice	2,450
South Lovington	1,220
Vacuum	11,630
Artesia-Maljamar	17,460
Aztec-Bloomfield	10
Getty	100
Hogback	200
Rattlesnake	340
Table Mesa	100
Total New Mexico	103,500
Total Rocky Mountain region	193,180

For WINTER Drilling
—an aid to the Crew

"One of the real values of the Patterson-Ballagh Pipe Wiper is in winter drilling when the temperature is below freezing," reports a West Texas Operator. "It prevents ice from collecting on the pipe. The men do not get their gloves wet and frozen. We don't have trouble with a frozen water line on the derrick floor because there is no need of washing the pipe. The crew can work faster. And then there is a big saving in mud. It isn't diluted with wash water."

Save on drilling costs

Unnecessary to wash pipe. Keeps floor clean. Saves water and mud.

Made in sizes to fit all Drill Pipe

PATTERSON-BALLAGH PIPE WIPER

Made from same grade of tough rubber c.s Patterson-Ballagh Protectors.

See Composite Catalog

PATTERSON-BALLAGH CORPORATION

LOS ANGELES • HOUSTON • NEW YORK CITY

Summary of Operations, All Fields, November

SUMMARY OF ALL FIELDS

Wells Completed

	Comp.	Prod.	Dry	Gas
Appalachian	390	377	25	73
Ohio	113	519	36	59
Kentucky	59	1,412	25	16
Michigan	73	4,807	38	7
Illinois	261	39,756	67	1
Indiana	53	4,771	20	4
Kansas	154	133,179	25	10
Oklahoma	163	13,848	33	24
Nebraska	1	314	8	0
N. Central Texas	219	57,834	69	3
West Texas	119	85,705	4	1
Texas Panhandle	25	4,528	2	3
East Texas	43	3,133	8	0
East Texas Border	7	10	5	1
Upper Texas Gulf	103	26,199	18	2
Lower Texas Gulf	49	4,801	11	2
S. Central Texas	10	576	5	0
South Texas	86	4,662	33	4
S.E. New Mexico	27	7,357	4	1
Arkansas	16	1,577	6	0
North Louisiana	82	6,699	21	9
Louisiana Gulf	83	15,825	27	1
Mississippi	17	5,014	5	1
Montana	29	1,972	2	10
Wyoming	21	5,934	6	1
Colorado	4	438	1	1
Total Nov.	2,207	431,247	504	234
Total Oct.	2,674	443,686	631	264
Difference	467	12,439	127	30

Rigs and Wells Drilling

	Rigs	Drlg.	Ttl.
Appalachian	51	415	466
Ohio	51	172	223
Kentucky	11	100	111
Michigan	37	120	157
Illinois	43	296	339
Indiana	3	67	70
Kansas	33	173	206
Oklahoma	34	212	246
Missouri	2	9	11
Nebraska	4	32	36
North Central Texas	123	286	409
West Texas	104	237	341
Texas Panhandle	20	66	86
Eastern Texas	23	61	84
East Texas Border	0	10	10
Upper Texas Gulf	36	99	135
Lower Texas Gulf	8	67	75
South Central Texas	4	43	47
South Texas	12	43	55
Southeast New Mexico	21	84	105
Arkansas	0	30	30
North Louisiana	0	85	85
Louisiana Gulf	24	119	143
Mississippi	0	35	35
Alabama	0	7	7
Florida	0	1	1
Georgia	0	2	2
Montana	3	70	73
Utah	2	5	7
Wyoming	8	66	74
Colorado	0	39	39
Northwest New Mexico	2	11	13
Total November	659	3,015	3,724
Total October	714	3,242	3,956
Difference	55	177	232

APPALACHIAN FIELDS

	Comp.	Prod.	Dry	Gas	Rgs.	Dlg.
Bradford	*221	239	0	0	18	156
Allegany	*42	57	0	0	3	22
N. Oriskany	6	0	6	0	2	16
Middle dist.	16	18	0	0	0	8
Butler-Armstrong	4	0	2	2	4	7
S.W. Penna.	33	4	3	28	6	57
W. Virginia	68	59	14	45	18	149
Ttl. Nov.	390	377	25	75	51	415
Ttl. Oct.	405	435	25	84	48	473
Difference	15	58	0	9	3	58

*Includes water-intake wells.

OHIO

	Comp.	Prod.	Dry	Gas	Rgs.	Dlg.
Ashland	3	1	0	2	2	4
Ashtabula	1	0	1	0	0	0
Athens	10	34	3	4	5	19
Belmont	0	0	0	0	0	1
Clinton	1	0	1	0	0	0
Coshocton	1	0	0	1	0	3
Cuyahoga	1	0	0	1	2	4
Fairfield	3	0	1	2	0	1
Gallia	1	0	0	1	0	2
Geauga	1	0	1	0	0	1
Guernsey	4	0	2	2	1	4
Harrison	0	0	0	0	0	2
Hocking	1	0	1	0	1	0
Holmes	6	0	2	4	1	4
Jackson	1	0	0	1	0	1
Jefferson	2	2	1	0	0	1
Knox	3	0	2	1	7	10
Lake	0	0	0	0	0	1
Lawrence	2	0	0	2	3	2
Licking	17	14	4	11	9	16
Lorain	5	0	3	2	1	8
Medina	9	75	1	2	3	9
Meigs	3	0	0	3	2	6
Monroe	5	0	1	4	1	10
Morgan	1	0	1	0	0	5
Muskingum	9	53	0	8	1	6
Noble	5	3	3	1	1	10
Perry	6	325	1	2	3	5
Richland	0	0	0	0	0	1
Stark	4	12	2	2	2	4
Summit	2	0	2	0	1	2
Tuscarawas	3	0	2	1	0	10
Vinton	1	0	1	0	0	0
Washington	2	0	0	2	5	18
Wayne	0	0	0	0	0	2
Ttl. Nov.	113	519	36	59	51	172
Ttl. Oct.	145	473	39	74	46	184
Difference	32	46	3	15	5	12

EASTERN KENTUCKY

	Comp.	Prod.	Dry	Gas	Rgs.	Dlg.
Estill	1	7	0	0	0	1
Lee	1	25	0	0	0	2
Magoffin	1	5	0	0	0	4
Wolfe	1	0	1	0	0	1
Knott	5	0	1	4	0	6
Floyd	6	0	3	3	2	7
Martin	3	0	0	3	1	8
Pike	7	0	1	6	2	12
Clark	0	0	0	0	0	1
Johnson	0	0	0	0	0	1
Breathitt	0	0	0	0	0	1
Morgan	0	0	0	0	0	2
Elliott	0	0	0	0	0	1
Greenup	0	0	0	0	1	0
Lawrence	0	0	0	0	1	0
Carter	0	0	0	0	0	1
Ttl. Nov.	25	37	6	16	7	48
Ttl. Oct.	15	62	1	4	5	31
Difference	10	25	5	12	2	17

Production above gas wells—12.2 million cu. ft.

WESTERN KENTUCKY

	Comp.	Prod.	Dry	Gas	Rgs.	Dlg.
Butler	0	0	0	0	0	1
Christian	1	0	1	0	0	1
Daviess	15	760	6	0	1	15
Grayson	0	0	0	0	0	2
Hancock	3	30	2	0	0	2
Henderson	2	50	1	0	0	3
Hopkins	1	0	1	0	0	1
Larue	0	0	0	0	0	1
McLean	3	515	1	0	0	9
Muhlenberg	1	0	1	0	1	0
Ohio	8	20	6	0	1	15
Webster	0	0	0	0	1	2
Ttl. Nov.	34	1,375	19	0	4	52
Ttl. Oct.	33	1,378	9	1	1	61
Difference	1	3	10	1	3	9

MICHIGAN

	Comp.	Prod.	Dry	Gas	Rgs.	Dlg.
Allegan	18	695	11	0	10	23
Arenac	3	1,680	2	0	3	8
Barry	1	0	1	0	1	1
Bay	0	0	0	0	0	3
Berrien	1	0	1	0	0	2
Branch	0	0	0	0	0	1
Cass	2	3	1	0	0	3
Clare	3	0	0	3	2	5
Gladwin	4	190	2	0	1	2
Gratiot	3	0	3	0	0	1
Huron	3	0	3	0	2	8
Ingham	0	0	0	0	0	1
Isabella	7	233	3	1	3	3
Kalamazoo	0	0	0	0	0	1
Kalkaska	0	0	0	0	1	0
Kent	2	435	1	0	2	6
Lenawee	0	0	0	0	1	2
Mainistee	0	0	0	0	0	1
Mason	0	0	0	0	1	1
Mecosta	1	0	1	0	0	0
Midland	2	539	0	0	0	3
Missaukee	0	0	0	0	0	1
Monroe	3	105	1	0	0	5
Montcalm	1	0	0	1	1	4
Muskegon	0	0	0	0	0	1
Oakland	0	0	0	0	0	1
Oceana	0	0	0	0	1	0
Ogemaw	1	13	0	0	0	3
Osceola	3	29	0	2	0	1
Otsego	0	0	0	0	0	1
Ottawa	7	415	3	0	4	13
Roscommon	0	0	0	0	1	0
Saginaw	0	0	0	0	0	1
St. Clair	0	0	0	0	0	1
Shiawassee	0	0	0	0	0	4
Tuscola	0	0	0	0	0	1
Van Buren	8	470	5	0	3	7
Wayne	0	0	0	0	0	1
Ttl. Nov.	73	4,807	38	7	37	120
Ttl. Oct.	137	9,912	66	14	34	135
Difference	64	5,105	28	7	3	15

*Gas production, million cubic feet: Clare, 12.267; Isabella, 3.31; Montcalm, 5.54; Osceola, 18.85.

ILLINOIS

	Comp.	Prod.	Dry	Gas	Rigs	Dlg.
Adams	0	0	0	0	0	1
Bond	6	195	2	0	0	6
Bureau	0	0	0	0	0	1
Clark	1	6	0	0	0	7
Clay	5	609	2	0	1	1
Clinton	10	5,708	1	0	4	8
Coles	0	0	0	0	0	1
Crawford	1	0	1	0	0	3
De Kalb	1	0	1	0	0	0
Douglas	0	0	0	0	0	1
Edwards	9	1,535	1	0	0	14
Effingham	0	0	0	0	0	1
Fayette	29	3,329	6	0	5	23
Ford	0	0	0	0	0	1
Franklin	4	762	0	0	1	6
Gallatin	2	0	2	0	1	3
Greene	0	0	0	0	0	2
Hamilton	19	1,747	2	0	1	18
Hancock	0	0	0	0	0	1
Jackson	0	0	0	0	0	3
Jasper	11	6,552	2	0	4	16
Jefferson	4	180	3	0	0	1
Jersey	1	0	1	0	0	0
Lawrence	3	30	0	1	0	5
McDonough	1	0	1	0	0	3
McLean	0	0	0	0	0	1
Macoupin	1	0	1	0	0	2
Madison	0	0	0	0	0	3
Marion	10	545	5	0	1	9
Montgomery	8	7	7	0	3	5
Perry	3	0	3	0	0	1
Peoria	1	0	1	0	0	0
Pope	0	0	0	0	0	1
Randolph	1	0	1	0	0	4
Richland	8	1,206	2	0	3	8
St. Clair	7	625	1	0	1	1
Saline	1	0	1	0	0	1
Shelby	3	25	2	0	0	2
Tazewell	0	0	0	0	0	1
Wabash	15	1,037	6	0	0	18
Warren	0	0	0	0	0	1
Washington	4	279	2	0	1	5
Wayne	21	4,597	1	0	0	17
White	70	10,782	8	0	17	91
Woodford	1	0	1	0	0	0
Ttl. Nov.	261	39,756	67	1	43	296
Ttl. Oct.	352	49,972	82	2	70	309
Difference	91	10,216	15	1	27	13

INDIANA

	Comp.	Prod.	Dry	Gas	Rigs	Dlg.
Adams	0	0	0	0	0	1
Benton	0	0	0	0	0	1
Crawford	0	0	0	0	0	1
Daviess	2	20	1	0	0	2
Dearborne	0	0	0	0	0	1
Decatur	0	0	0	0	0	1
Dubois	0	0	0	0	0	1
Gibson	14	2,312	3	0	2	17
Greene	1	0	1	0	0	2
Hamilton	1	0	1	0	0	1
Hancock	0	0	0	0	0	1
Harrison	1	0	1	0	0	1
Henry	1	0	0	1	0	0
Jackson	0	0	0	0	0	1
Jay	0	0	0	0	0	1
Jasper	1	0	1	0	0	1
Knox	7	473	3	0	0	4
Lake	0	0	0	0	0	1
Martin	0	0	0	0	0	2
Newton	0	0	0	0	0	1
Pike	0	0	0	0	0	2
Porter	0	0	0	0	0	2
Posey	14	1,946	2	0	1	10
Randolph	3	0	3	0	0	0
Shelby	0	0	0	0	0	1
Spencer	3	0	1	2	0	5
Steuben	0	0	0	0	0	1
Sullivan	2	0	1	1	0	2
Vanderburg	3	20	2	0	0	0
Vigo	0	0	0	0	0	2
Warrick	0	0	0	0	0	1
Ttl. Nov.	53	4,771	20	4	3	67
Ttl. Oct.	68	5,306	23	13	10	76
Difference	15	535	3	9	7	9

*Gas production in million cubic feet: Henry, 0.025; Spencer, 7.134.

KANSAS

	Comp.	Prod.	Dry	Gas	Rigs	Dlg.
Barber	0	0	0	0	1	3
Barton	23	28,938	1	1	3	10
Butler	5	230	1	0	0	0
Cowley	8	1,606	3	0	0	1
Ellis	18	8,672	9	0	1	11
Ellsworth	15	16,626	0	0	2	15
Graham	1	96	0	0	0	0
Grant	2	0	0	2	0	1
Greenwood	6	77	0	2	0	1
Jefferson	0	0	0	0	0	2
Kingman	2	0	0	2	0	5
Leavenworth	0	0	0	0	0	1
McPherson	15	22,939	0	1	0	12
Marion	3	474	2	0	0	5
Phillips	3	2,613	1	0	1	0
Pratt	1	0	0	1	1	1
Reno	3	639	0	0	0	4
Rice	12	7,203	2	1	1	16
Rooks	3	6,141	0	0	1	5
Russell	19	25,769	2	0	8	24
Rush	1	498	0	0	0	1
Scott	0	0	0	0	0	1
Sedgwick	2	0	2	0	0	0
Stafford	9	10,652	0	0	0	18
Stevens	0	0	0	0	1	0
Trego	1	0	1	0	0	0
Woodson	2	6	1	0	0	0
Miscellaneous	0	0	0	0	13	36
Ttl. Nov.	154	133,179	25	10	33	173
Ttl. Oct.	174	52,139	34	2	26	215
Difference	20	81,040	9	8	7	42

OKLAHOMA

	Comp.	Prod.	Dry	Gas	Rigs	Dlg.
Beckham	1	0	0	1	0	0
Caddo	10	2,380	1	5	0	7
Carter	23	3,483	2	3	3	21
Comanche	5	0	5	0	0	2
Creek	12	409	3	1	2	12
Grady	2	80	0	0	0	2
Hughes	2	0	1	1	0	1
Jackson	4	242	1	0	1	7
Jefferson	2	15	0	0	0	0
Kay	1	0	1	0	0	1
Kiowa	3	584	2	0	0	1
Le Flore	2	0	2	0	0	0
Lincoln	6	938	0	1	0	5
Logan	2	100	0	1	0	5
Marshall-Bryan	8	1,739	0	0	1	10
McClain	1	0	1	0	0	0
McIntosh	1	0	0	1	0	2
Muskogee	3	26	1	0	0	0
Noble	1	13	0	0	0	0
Okfuskee	10	2,232	1	2	1	9
Oklahoma	0	0	0	0	1	8
Okmulgee	5	107	1	0	6	21
Osage	11	229	2	2	3	8
Pawnee	3	0	0	3	0	3
Payne	2	15	0	0	1	2
Pittsburg	2	0	0	2	0	0
Pontotoc	7	147	3	0	1	10
Pottawatomie	5	321	2	0	2	9
Seminole	10	267	0	0	2	18
Stephens	10	243	2	0	2	4
Tillman	1	246	0	0	0	0
Tulsa	2	10	0	0	1	11
Wagoner	6	22	2	1	3	5
Miscellaneous	0	0	0	0	4	28
Ttl. Nov.	163	13,848	33	24	34	212
Ttl. Oct.	190	31,066	59	22	38	281
Difference	27	17,218	26	2	4	69

WEST CENTRAL AND NORTH TEXAS

	Comp.	Prod.	Dry	Gas	Rgs.	Dlg.
Archer	28	8,002	9	0	22	36
Brown	2	0	2	0	1	4
Baylor	0	0	0	0	0	5
Callahan	4	0	3	1	2	8
Clay	22	5,577	11	0	10	15
Coleman	5	622	0	0	3	13
Comanche	1	0	0	1	0	2
Concho	0	0	0	0	0	2
Cooke	19	3,645	3	0	6	17
Denton	0	0	0	0	0	2
Erath	0	0	0	0	0	1
Eastland	2	8	1	0	0	8
Fisher	0	0	0	0	0	2
Foard	1	32	0	0	0	2
Grayson	0	0	0	0	0	1
Hamilton	0	0	0	0	1	6
Haskell	2	0	2	0	0	1
Hood	0	0	0	0	0	2
Jack	6	929	1	0	7	14
Jones	13	2,966	2	0	6	16
Montague	10	10,518	1	0	4	17
Nolan	0	0	0	0	0	1
Palo Pinto	0	0	0	0	1	8
Parker	0	0	0	0	0	2
Runnels	0	0	0	0	1	3
San Saba	0	0	0	0	0	1
Shackelford	7	45	5	0	13	10
Stephens	1	180	0	0	1	5
Tarrant	0	0	0	0	0	4
Taylor	1	0	1	0	0	6
Throckmorton	0	0	0	0	2	3
Wichita	42	12,315	11	0	22	36
Wilbarger	6	2,796	0	0	4	10
Wise	0	0	0	0	1	2
Young	47	10,199	17	1	16	21
Ttl. Nov.	219	57,834	69	3	123	286
Ttl. Oct.	289	73,292	102	3	127	255
Difference	70	15,458	33	0	4	31

WEST TEXAS

	Comp.	Prod.	Dry	Gas	Rgs.	Dlg.
Andrews	4	3,007	1	0	4	3
Crane	6	10,085	0	0	7	12
Concho	0	0	0	0	0	2
Cochran	4	1,386	0	0	3	8
Crockett	1	0	1	0	4	13
Culberson	0	0	0	0	0	1
Ector	24	20,893	1	0	19	42
Gaines	16	10,557	0	0	8	25
Hockley	12	9,726	0	0	11	22
Howard	0	0	0	0	0	1
Hudspeth	0	0	0	0	0	2
Irion	0	0	0	0	0	1
Loving	0	0	0	0	0	* 1
Menard	0	0	0	0	0	1
Mitchell	0	0	0	0	0	5
Pecos	9	1,131	1	1	11	24
Presidio	0	0	0	0	0	1
Reeves	0	0	0	0	0	1
Schleicher	0	0	0	0	0	1
Scurry	4	578	0	0	6	7
Stonewall	0	0	0	0	0	1
Sutton	0	0	0	0	1	2
Terrell	0	0	0	0	0	2
Terry	2	1,275	0	0	0	3
Tom Green	0	0	0	0	0	2
Upton	5	4,380	0	0	6	6
Ward	9	7,778	0	0	2	12
Winkler	3	880	0	0	3	7
Yoakum	20	14,029	0	0	19	29
Ttl. Nov.	119	85,705	4	1	104	237
Ttl. Oct.	156	119,969	11	3	126	249
Difference	37	34,264	7	2	22	12

TEXAS PANHANDLE

	Comp.	Prod.	Dry	Gas	Rgs.	Dlg.
Carson	4	1,475	0	0	3	8
Cottle	1	0	1	0	0	1
Dickens	0	0	0	0	0	1
Gray	10	1,395	0	0	6	18
Hansford	1	0	1	0	0	0
Lubbock	0	0	0	0	1	0
Hutchinson	6	1,658	0	0	8	26
Motley	0	0	0	0	0	1
Moore	3	0	0	3	1	4
Ochiltree	0	0	0	0	0	1
Swisher	0	0	0	0	0	1
Wheeler	0	0	0	0	1	5
Ttl. Nov.	25	4,528	2	3	20	66
Ttl. Oct.	55	9,962	5	7	18	71
Difference	30	5,434	3	4	2	5

EASTERN TEXAS

	Comp.	Prod.	Dry	Gas	Rgs.	Dlg.
Anderson	3	34	2	0	2	6
Camp	0	0	0	0	0	1
Delta	0	0	0	0	0	1
Ellis	1	0	1	0	0	0
Falls	0	0	0	0	0	1
Fannin	0	0	0	0	1	1
Franklin	2	842	0	0	1	2
Freestone	3	279	0	0	2	5
Gregg	18	835	0	0	6	9
Henderson	0	0	0	0	0	2
Hopkins	0	0	0	0	0	1
Houston	0	0	0	0	0	2

	Comp.	Prod.	Dry	Gas	Rgs.	Dlg.
Kaufman	1	0	1	0	0	1
Lamar	0	0	0	0	0	1
Leon	0	0	0	0	0	1
Limestone	0	0	0	0	0	4
McLennan	1	0	1	0	0	1
Navarro	0	0	0	0	0	4
Red River	0	0	0	0	0	1
Rusk	5	102	1	0	2	3
Smith	2	60	0	0	7	9
Titus	3	877	0	0	0	2
Upshur	4	104	2	0	0	2
Wood	0	0	0	0	2	1
Ttl. Nov.	43	3,133	8	0	23	61
Ttl. Oct.	65	5,220	10	4	25	60
Difference	22	2,087	2	4	2	1

EAST TEXAS BORDER

Bowie	2	0	2	0	0
Cass	1	0	1	0	0
Harrison	0	0	0	0	3
Marion	2	10	1	0	4
Panola	1	0	0	1	1
Sabine	1	0	1	0	0
Shelby	0	0	0	0	2
Total Nov.	7	10	5	1	10
Total Oct.	10	590	5	2	10
Difference	3	580	0	1	0

*Gas production, million cubic feet: Panola County, 30.

UPPER TEXAS GULF COAST

Alta Loma	2	208	1	0	1	0
Anahuac	6	2,907	0	0	1	2
Barbers Hill	0	0	0	0	0	1
Bay City	1	324	0	0	0	1
Batson	0	0	0	0	0	1
Blue Ridge	2	604	0	0	1	0
Boling	0	0	0	0	1	0
Caplen	0	0	0	0	0	1
Chocolate Bayou	0	0	0	0	0	2
Clear Lake	1	145	0	0	1	0
Clam Lake	0	0	0	0	0	1
Danbury	1	0	1	0	0	1
Dickinson	0	0	0	0	0	1
Dyersdale	5	1,476	1	0	3	0
Esperson	4	941	0	1	1	2
Fannett	1	817	0	0	0	3
Fairbanks	2	278	0	0	0	2
Fisher's Reef	1	187	0	0	1	1
Greens Lake	1	143	0	0	0	1
Ganado	0	0	0	0	0	1
Hardin	0	0	0	0	0	2
Hastings	1	666	0	0	0	1
Hillje	2	0	2	0	1	2
Hull	2	202	1	0	1	2
Humble	2	132	1	0	1	2
League City	0	0	0	0	0	1
La Belle	0	0	0	0	0	1
Lolita	6	1,690	0	0	3	5
Lovells Lake	3	354	1	0	1	1
Magnet	3	445	0	0	1	0
Manvel	1	507	0	0	0	1
Markham	1	145	0	0	0	0
N. Markham	0	0	0	0	0	1
Ogburn	1	162	0	0	0	2
Old Ocean	2	846	0	0	1	7
Pierce Jctn.	1	343	0	0	1	0
Port Neches	2	297	0	0	2	0
Red Fish Reef	0	0	0	0	0	5
Rowan	3	339	1	0	0	2
Seabreeze	0	0	0	0	0	1
Saratoga	1	37	0	0	0	1
Segno	1	477	0	0	0	2
S. China	1	140	0	0	1	1
Sour Lake	0	0	0	0	0	1
Spurger	3	1,063	0	0	1	1
S. Liberty	2	338	0	0	0	2
Sheridan	0	0	0	0	0	1
Sugarland	1	0	1	0	0	0
Thompson	3	1,464	0	0	1	1
Tomball	3	368	0	1	0	1
Van Vleck	1	417	0	0	0	1
W. Beaumont	1	2,770	0	0	0	1
W. Ganado	0	0	0	0	0	1
W. Ranch	7	3,100	0	0	4	10
W. Columbia	5	1,014	1	0	0	3
Withers	10	853	0	0	1	5
Miscellaneous	7	0	7	0	6	11
Ttl. Nov.	103	26,199	18	2	36	99
Ttl. Oct.	103	22,756	21	4	35	96
Difference	0	3,443	3	2	1	3

LOWER TEXAS GULF COAST

Agua Dulce	1	168	0	0	0	3
Baffin Bay	0	0	0	0	0	1
Ben Bolt	1	10	0	0	1	2
Clara Driscoll	1	113	0	0	0	4
Coletto Ck.	1	0	0	1	0	0
Duck Bay	1	61	0	0	0	0
E. Alice	2	0	2	0	0	1
E. Premont	0	0	0	0	0	1
E. White Point	1	124	0	0	0	2
E. Flour Bluff	3	534	0	0	0	2
Edwards Ranch	1	0	1	0	0*	0
Henshaw	1	10	0	0	0	0
Heyser	2	200	0	0	0	1
La Gloria	0	0	0	0	1	1
McCampbell	0	0	0	0	0	2
McFaddin	1	5	0	0	1	2
Midway	1	120	0	0	0	2
Nixon	1	0	0	1	0	0
Orange Grove	3	337	1	0	1	1
Refugio	0	0	0	0	0	1
Richard King	1	106	0	0	0	2
Placedo	0	0	0	0	0	1
Riverside	0	0	0	0	0	1
Shield	1	153	0	0	0	0
S. Clara Driscoll	6	268	1	0	1	1
St. Charles	0	0	0	0	0	1
Stratton	4	177	1	0	0	9
Telferner	0	0	0	0	0	1
Thomaston	1	41	0	0	0	0
Tomoconnor	2	1,203	0	0	0	1
Victoria	0	0	0	0	0	1
Weser	0	0	0	0	0	1
Wade City	7	908	0	0	1	3
Willamar	1	263	0	0	1	0
Miscellaneous	5	0	5	0	1	19
Ttl. Nov.	49	4,801	11	2	8	67
Ttl. Oct.	62	6,218	15	3	10	60
Difference	13	1,417	4	1	2	7

SOUTH CENTRAL TEXAS

Bee Creek	3	487	1	0	0	1
Byersville	0	0	0	0	0	1
Carroll	0	0	0	0	0	1
Chacon Lake	0	0	0	0	0	1
Coffey	0	0	0	0	0	1
Day	1	30	0	0	0	1
Darst Creek	0	0	0	0	0	1
Elm Creek	1	16	0	0	0	3
Gas Ridge	0	0	0	0	0	1
La Coste	0	0	0	0	0	1
Luling	0	0	0	0	1	0
Pearsall	0	0	0	0	0	3
Mountain View	0	0	0	0	1	0
Red Rock	1	0	1	0	0	0
Salt Flat	1	43	0	0	0	0
Rockdale	0	0	0	0	0	1
Thrall	0	0	0	0	1	0
Tillman	0	0	0	0	0	1
Miscellaneous	3	0	3	0	1	27
Ttl. Nov.	10	576	5	0	4	43
Ttl. Oct.	23	753	7	2	4	36
Difference	13	177	2	2	0	7

SOUTH TEXAS

Boyle	1	19	0	0	0	3
Bruni	1	40	0	0	0	0
Calliham	1	7	0	0	0	1
Casa Blanca	4	145	0	0	0	1
Cedro Hill	3	28	2	0	1	1
Charco Redondo	2	0	2	0	0	0
Colorado	12	1,869	0	0	1	6
Driscoll	3	246	2	0	0	2
Escobas	0	0	0	0	0	1
Glen	5	595	0	0	1	2
Hoffman	3	85	0	1	0	2
Kelsey	3	216	1	0	1	1
Lopeno	1	0	0	1	1	0
Lundell	10	331	3	0	1	1
Labbe	0	0	0	0	0	1
Manila	2	106	0	0	0	1
Mirando Valley	1	0	1	0	0	0
Nichols	1	52	0	0	0	0
N. Rincon	1	0	1	0	0	1
Oakville	0	0	0	0	0	1
Peters	1	0	0	0	1	0
Ricaby	0	0	0	0	1	0
Rincon	2	418	0	0	0	2
San Salvador	0	0	0	0	0	1
Samfordyce	3	226	0	0	1	2
Seven Sisters	1	0	0	1	0	0
S. Calliham	0	0	0	0	0	2
Sun	1	17	0	0	0	1
Tesoro	0	0	0	0	0	1
Washburn	1	0	1	0	1	0
White Creek	4	262	1	0	0	1
Yzaguirre	0	0	0	0	0	1
Miscellaneous	19	0	19	0	2	7
Ttl. Nov.	86	4,662	33	4	12	43
Ttl. Oct.	92	5,185	35	1	11	47
Difference	6	523	2	3	1	4

SOUTHEAST NEW MEXICO

Chaves	0	0	0	0	1	2
DeBaca	0	0	0	0	0	1
Dona Ana	0	0	0	0	0	2
Eddy	13	1,165	1	0	9	37
Lea	14	6,192	3	1	11	39
Otero	0	0	0	0	0	2
Socorro	0	0	0	0	0	1
Ttl. Nov.	27	7,357	4	1	21	84
Ttl. Oct.	50	10,851	9	2	19	82
Difference	23	3,494	5	1	2	2

NORTH LOUISIANA

Bienville	1	0	1	0	1	
Bossier	7	450	†5	0	7	
Caddo	27	1,506	4	0	25	
Caddo—Rodessa	0	0	0	0	1	
Catahoula	2	0	2	0	0	
Caldwell	0	0	0	0	1	
Claiborne†	1	0	1	0	5	
De Soto	2	0	1	1	3	
Franklin	0	0	0	0	1	
Grant	3	25	2	0	1	
La Salle	23	3,740	1	0	18	
Morehouse	2	0	1	1	1	
Natchitoches	0	0	0	0	2	
Ouachita	4	0	0	0	2	
Red River	1	0	1	0	3	
Sabine	2	90	0	0	6	
Tensas	0	0	0	0	1	
Union	3	0	0	3	2	
Webster	3	888	1	0	6	
Winn	1	0	1	0	0	
Total Nov.	82	6,699	21	9	85	
Total Oct.	88	4,950	16	8	91	
Difference	14	1,749	5	1	6	

*Gas in million cubic feet: De Soto Parish, 2; Morehouse Parish, 3; Ouachita Parish, 19.5; Union Parish, 5.5. †Includes one injection well. ‡Does not include three deepening jobs; one dry, one completed for 81 bbl. daily, one completed for injection well.

ARKANSAS

Arkansas	0	0	0	0	1
Clark	1	0	1	0	4
Columbia	3	970	0	0	2
Dallas	0	0	0	0	1
Hempstead	0	0	0	0	1
Howard	0	0	0	0	1
Lafayette	1	26	0	0	2
Lonoke	0	0	0	0	2
Nevada	2	18	1	0	1
Ouachita	0	0	0	0	1
Prairie	0	0	0	0	1
Saline	1	0	1	0	2
St. Francis	0	0	0	0	1
Union	8	563	3	0	9
Woodruff	0	0	0	0	1
Total Nov.	16	1,577	6	0	30
Total Oct.	15	2,630	5	1	34
Difference	1	1,053	1	1	4

COASTAL LOUISIANA

Anse La Butte	2	358	0	0	1	5
Barataria	1	275	0	0	0	1
Bateman Lake	0	0	0	0	0	2
Bayou Blue	2	357	0	0	0	3
Bayou Bouillon	2	43	1	0	0	1
Bayou de Glaize	0	0	0	0	0	1
Bay St. Elaine	2	323	1	0	0	2
Bayou Pigeon	0	0	0	0	0	1
Belle Chasse	1	265	0	0	1	0
Caillou Island	1	0	1	0	1	0
Charenton	4	0	4	0	1	2
Choctaw	1	349	0	0	1	0
Chalkley	1	0	1	0	0	2
Chacahoula	1	16	0	0	0	1
Cheneyville	1	240	0	0	0	1
Cameron Meadows	1	0	1	0	0	0
Darrow	2	328	0	0	0	1
Delta Farms	0	0	0	0	0	1
Dog Lake	1	209	0	0	1	0
E. Baton Rouge	4	538	0	1	1	2
Edgerly	0	0	0	0	0	2
Eola	1	0	1	0	0	2
Fausse Point	3	523	2	0	0	1
Gibson	1	321	0	0	1	0
Grand Bay	2	893	0	0	0	2
Golden Meadow	7	1,792	0	0	1	4
Garden Island	1	176	0	0	0	1
Gueydan	1	23	0	0	0	1
Hackberry	4	352	3	0	0	4
Happytown	0	0	0	0	0	1
Horseshoe Bayou	0	0	0	0	1	0
Iowa	2	840	1	0	1	5
Jeanerette	0	0	0	0	0	2
Jennings	1	0	1	0	0	4
Jefferson Island	0	0	0	0	0	1
La Fourche Crossing	0	0	0	0	0	1
La Fitte	0	0	0	0	0	2
Lake Mongoulois	0	0	0	0	0	1
Lake Hermitage	0	0	0	0	0	1
Lake Pelto	1	0	1	0	1	0
La Pice	1	454	0	0	1	0
Lake Salvador	1	487	0	0	0	2
Leesville	2	753	0	0	1	0
Neale	1	208	0	0	0	2
N. Crowley	1	796	0	0	0	1
New Iberia	3	754	0	0	2	1
Paradis	0	0	0	0	0	2
Port Barre	0	0	0	0	0	2
Plumb Bob	0	0	0	0	0	1
Potash	1	640	0	0	0	1
Quarantine Bay	2	526	1	0	0	2
Raceland	0	0	0	0	0	1
Ritchie	0	0	0	0	0	1
S. Crowley	0	0	0	0	0	1
S. China	0	0	0	0	0	1
S. Roanoke	0	0	0	0	0	1
Sorrento	0	0	0	0	1	1
Starks	0	0	0	0	0	1
Schooner Bayou	0	0	0	0	0	2
Sulphur	1	176	0	0	1	2
Sweet Lake	0	0	0	0	0	1
Valentine	1	280	0	0	1	0
Vermilion Bay	0	0	0	0	0	1
Ville Platte	7	1,626	0	0	1	8
Venice	1	195	0	0	1	0
Vinton	0	0	0	0	0	1
Welsh	1	0	1	0	0	0
W. Cote Blanche	0	0	0	0	0	1
W. Lake Verrett	1	235	0	0	1	1
White Castle	1	474	0	0	0	1
Woodlawn	0	0	0	0	0	2
Miscellaneous	7	0	7	0	2	18
Ttl. Nov.	83	15,825	27	1	24	119
Ttl. Oct.	85	17,721	22	0	14	132
Difference	2	1,896	5	1	10	13

MISSISSIPPI

Attala	1	0	1	0	1
Bolivar	0	0	0	0	1
Carroll	0	0	0	0	1
Clarke	0	0	0	0	1
Forrest	0	0	0	0	1
Grenada	0	0	0	0	2
Hinds	1	0	0	1	1
Itawamba	0	0	0	0	1
Jones	0	0	0	0	1
Kemper	0	0	0	0	1
Lee	0	0	0	0	1
Marshall	0	0	0	0	1
Montgomery	0	0	0	0	1
Noxubee	0	0	0	0	2
Pike	0	0	0	0	1
Prentiss	0	0	0	0	1
Sharkey	0	0	0	0	1
Simpson	0	0	0	0	1
Tishomingo	0	0	0	0	1
Warren	2	0	2	0	1
Winston	0	0	0	0	1
Yalobusha	0	0	0	0	1
Yazoo	13	5,014	2	0	11
Total Nov.	17	5,014	5	1	35
Total Oct.	10	1,740	5	0	34
Difference	7	3,274	0	1	1

*Gas production, million cubic feet: Hinds County, 35.

ALABAMA

Colbert	0	0	0	0	1
Fayette	0	0	0	0	1
Franklin	0	0	0	0	1
Houston	0	0	0	0	1
Madison	0	0	0	0	2
Walker	0	0	0	0	1
Total Nov.	0	0	0	0	7
Total Oct.	4	0	4	0	6
Difference	4	0	4	0	1

FLORIDA

Dade	0	0	0	0	1
Total Nov.	0	0	0	0	1
Total Oct.	0	0	0	0	1
Difference	0	0	0	0	0

MONTANA

Big Horn	0	0	0	0	0	2
Blaine	0	0	0	0	0	3
Carbon	1	124	0	0	0	3
Fallon	1	0	0	1	0	3
Fergus	1	0	0	1	0	3
Glacier	14	1,697	1	1	3	11
Hill	0	0	0	0	0	1
Liberty	1	0	0	1	0	2
Petroleum	0	0	0	0	0	2
Phillips	5	0	0	5	0	12
Pondera	0	0	0	0	0	1
Stillwater	1	0	1	0	0	0
Toole	5	151	0	1	0	17
Miscellaneous	0	0	0	0	0	6
Ttl. Nov.	29	1,972	2	10	3	70
Ttl. Oct.	23	1,440	5	5	2	78
Difference	6	532	3	5	1	8

WYOMING

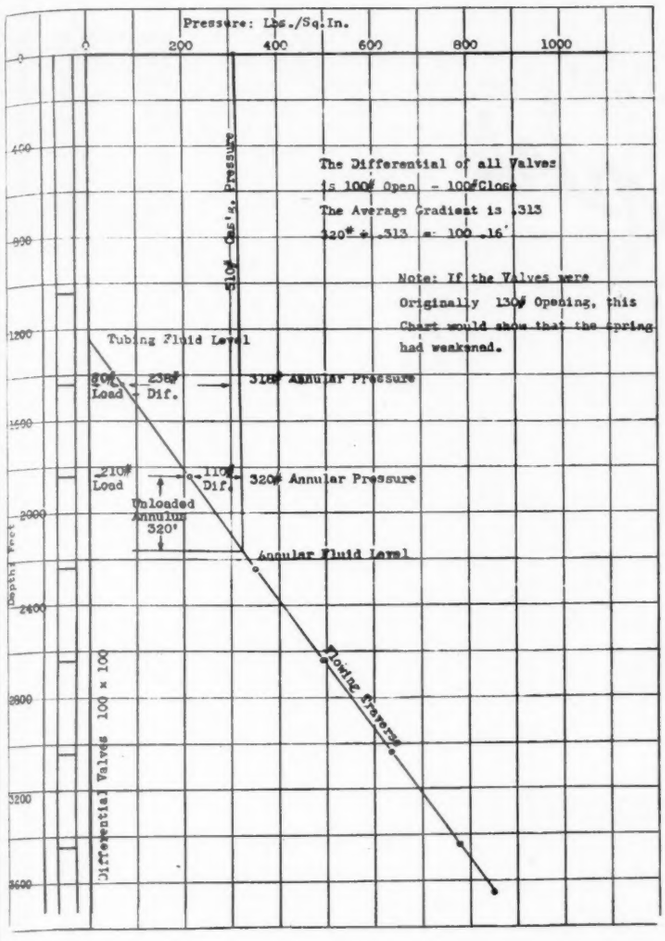
Big Horn	0	0	0	0	1	3
Campbell	0	0	0	0	0	1
Carbon	1	511	0	0	3	6
Converse	0	0	0	0	1	2
Crook	0	0	0	0	0	3
Fremont	0	0	0	0	0	2
Hot Springs	1	0	1	0	0	3
Lincoln	4	34	2	0	0	2
Natrona	1	160	0	0	0	5
Niobrara	6	4,001	0	0	0	5
Park	1	108	0	0	0	2
Platte	0	0	0	0	0	1
Sublette	3	280	1	0	2	4
Sweetwater	3	840	1	1	1	6
Uinta	0	0	0	0	0	5
Washakie	0	0	0	0	0	2
Weston	1	0	1	0	0	14
Ttl. Nov.	21	5,934	6	1	8	66
Ttl. Oct.	18	5,130	7	1	9	68
Difference	3	804	1	0	1	2

COLORADO

Archuleta	0	0	0	0	0	2
Boulder	0	0	0	0	0	1
Custer	0	0	0	0	0	1
El Paso	0	0	0	0	0	1
Fremont	0	0	0	0	0	1
Garfield	0	0	0	0	0	1
Huerfano	1	2	0	0	0	8
Jackson	0	0	0	0	0	1
La Plata	0	0	0	0	0	2
Larimer	0	0	0	0	0	2
Las Animas	0	0	0	0	0	2
Lincoln	0	0	0	0	0	1
Logan	0	0	0	0	0	1
Moffat	1	0	0	1	0	2
Montezuma	1	0	1	0	0	1
Ouray	0	0	0	0	0	1
Park	0	0	0	0	0	1
Pueblo	0	0	0	0	0	1
Rio Blanco	1	436	0	0	0	6
Routt	0	0	0	0	0	2
Washington	0	0	0	0	0	1
Ttl. Nov.	4	438	1	1	0	39
Ttl. Oct.	2	212	0	0	0	35
Difference	2	226	1	1	0	4

NORTHWEST NEW MEXICO

McKinley	0	0	0	0	0	1
Bernalillo	0	0	0	0	1	1
San Juan	0	0	0	0	0	4
San Miguel	0	0	0	0	0	1
Socorro	0	0	0	0	0	1
Torrance	0	0	0	0	1	1
Valencia	0	0	0	0	0	2
Ttl. Nov.	0	0	0	2	11	
Ttl. Oct.	4	97	1	1	1	11
Difference	4	97	1	1	1	0



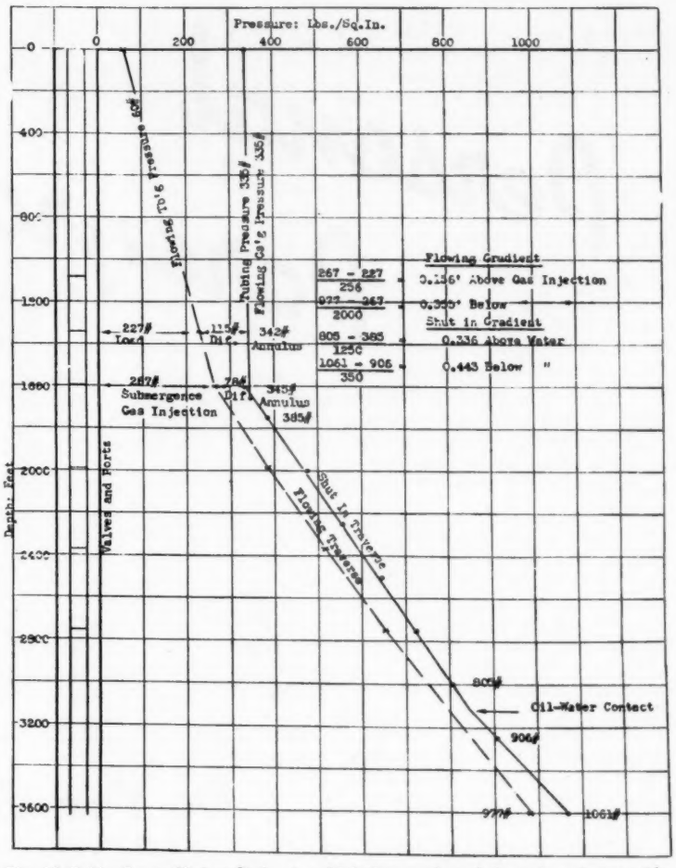


Fig. 12 (left)—A gas-lift installation in which the spacing of the valves is too wide. Fig. 13 (above)—Shut-in and flowing traverses of a gas-lift well showing the point of gas injection; submergence and oil-water contact

Applying Subsurface-Pressure Measurements in East Texas

(Continued from Page 32)

the annular fluid level using the average casing pressure. Correction is made for the type of fluid in the well. (See Fig. 11, Curve 2.) The rate of production expected is extended to the curve and the flowing annular fluid level is indicated.

3. The lowest valve or port should be above the lowest practical flowing annular fluid level. This level is determined from a productivity curve plotted with the rate of production against the annular fluid level using the maximum casing pressure. The fluid level is corrected for the type of fluid in the well. (See Fig. 11, Curve 3.) The maximum rate of production expected is extended to the curve and the annular level is indicated.

4. The equalizing ports or devices should be placed below the lowest possible annular fluid level. This is a theoretical level that would exist with all water in the well and maximum casing pressure while producing at a maximum rate. This level is obtained from a productivity curve plotted with rate of production against the annular level with all water in the well and the maximum casing pressure. (See Fig. 11, Curve 4.) The maximum rate is extended to the curve and annular level is indicated.

5. The maximum space between the valves, or the distance a valve will unload below itself, is determined by dividing the differential opening pressure by the maximum gradient of fluid that will be produced from the annular space. If no water is to be produced, the average flowing gradient below the valve may be used.

Fig. 11 is an illustration of the application of bottom-hole-pressure data to the design of a gas-lift installation for a west-side well in the East Texas field. The gas pressure available is 250 lb. minimum, 300 lb. average and 400 lb. maximum.

The 250 lb. pressure is extended to the static gradient indicating the top valve should be above 1,010 ft. from the surface. It is assumed from past experience that the valves will produce 30 bbl. per hour. Thus the 30-bbl.-per-hour rate is extended to the respective curves indicating the operating valves should be just above 1,650 ft., the lowest valve above 1,950 ft. and the equalizing port below 2,415 ft. The valves are 110-lb. differential opening, and the average gradient of the fluid that will be removed from the casing is 0.440 lb. This gives a spacing of 250 ft.

While analyzing flow-valve installations, the bottom - hole - pressure data were used to determine the following:

1. The incorrect spacing of valves was found by locating the fluid level in annular space and

(Continued on Page 92)

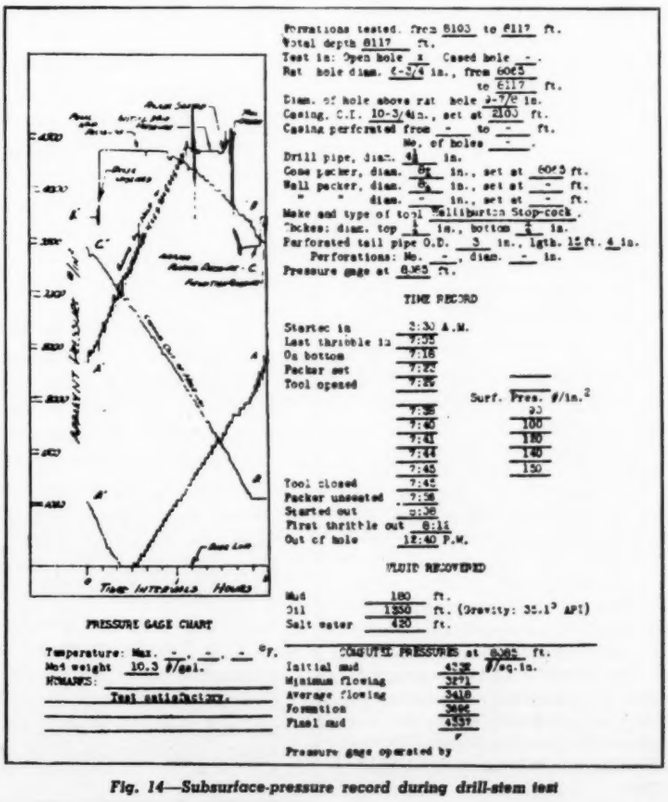

Formations tested. From 8103 to 8117 ft.
Total depth 8117 ft.
Test in: Open hole x Cased hole -.
Rat hole diam. 6-3/4 in., from 6065 to 8117 ft.
Diam. of hole above rat hole 9-7/8 in.
Casing, O.D. 10-3/4 in., set at 2103 ft.
Casing perforated from - to - ft.
No. of holes -.
Drill pipe, diam. 4½ in.
Cone packer, diam. 8¼ in., set at 6065 ft.
Ball packer, diam. 8¼ in., set at - ft.
" " diam. - in., set at - ft.
Make and type of tool Halliburton Stop-cock.
Chokes: diam. top ½ in., bottom ¾ in.
Perforated tail pipe O.D. 3 in., lgth. 12 ft. 4 in.
Perforations: No. -, diam. - in.
Pressure gage at 8085 ft.
TIME RECORD
Started in 3:30 A.M.
Last thribble in 7:05
On bottom 7:16
Packer set 7:25
Tool opened 7:35
Surf. Pres. #/in.²
7:35 30
7:40 100
7:41 130
7:44 140
7:45 150
Tool closed 7:45
Packer unseated 7:50
Started out 8:20
First thribble out 8:31
Out of hole 12:40 P.M.
FLUID RECOVERED
Mud 180 ft.
Oil 1350 ft. (Gravity: 35.1° API)
Salt water 420 ft.
GAUGE PRESSURES at 8082 ft.
Initial mud 4238 #/sq.in.
Minimum flowing 3471
Average flowing 3410
Formation 3466
Final mud 4337
Pressure gage operated by
Time Intervals Hours
PRESSURE GAGE CHART
Temperature: Max. - - - °F.
Mud weight 10.3 #/gal.
REMARKS:
Test satisfactory.

Fig. 14—Subsurface-pressure record during drill-stem test

Personal Paragraphs

LOWRY R. LYTLE, president of the Colony Oil Co. of California, and well known oil operator on the Pacific Coast, is making an extended trip through Texas and the Gulf Coast fields and plans to visit old friends in Tyler and Dallas, Tex. Mr. Lytle was a pioneer in the oil development at Desdemona and Ranger of West Central Texas during the early booms in those fields.

WALTER W. CLOPTON, has been promoted from the position of district pipe-line superintendent to district manager of the United Gas Pipe Line Co.'s system at Wichita Falls, Tex. Four years ago he was transferred to Wichita Falls from Latex, La.

THOMAS J. HARKINS, chief chemist of the Pennzoil Co., Oil City, Pa., has been named a member of the technical advisory committee of the Pennsylvania Grade Crude Oil Association, succeeding P. M. ROBINSON, chief engineer of the company, who has been appointed assistant to DR. R. E. WILSON, head of the petroleum section of the National Defense Advisory Commission.

PAUL L. GUARIN, assistant manager of the production department of the Shell Oil Co. Inc., Houston, Tex., has been elected chairman of Houston chapter of the American Petroleum Institute, division of production.

A. E. POST, of San Francisco, and vice president of Hawaiian American Co.; THOMAS J. QUIGLEY; ROBERT E. MORAN; R. F. RHOADES, and THOMAS WORK, of Los Angeles, have organized the Oxnard Exploration Co. and will undertake drilling operations in the Oxnard district of Ventura County, California. At the organization meeting Mr. Post was elected president and Mr. Quigley was selected vice president.

WILLIAM BROOKOVER, pipe-line superintendent, Anderson-Prichard Oil Corp., Oklahoma City, Okla., was presented with a 20-year award at a dinner held by over 100 employes and officials of the company at Colorado City, Tex., last week. The award was made by L. H. PRICHARD, president of the company.

OSCAR R. HOWARD, independent oil producer in the Santa Fe Springs field of Los Angeles Basin, was called out of bed at an early hour recently when radio police 20 miles away saw one of his wells burning. A slipping belt on a pumping engine started the fire but it was confined to one wooden derrick and equipment including one tank of oil.

JAKE L. HAMON and JOHN G. PEW, prominent oil men of Dallas, Tex., have been named directors of the Dallas Chamber of Commerce.

RALPH HAMMOND, Carter Oil Co., addressed the Illinois Basin chapter of the American Petroleum Institute at its recent meeting in Salem. His topic was "The Electrification of the Pumping Equipment in the Illinois Fields."

J. E. SHATFORD, well known in Arkansas oil circles, will become economic adviser of the Pure Oil Co. on January 1. Mr. Shatford was a member of the NIRA code committee and later was with the antitrust division of the Department of Justice.

HENRY WATERS, Tulsa, who became vice president of Stanolind Oil Purchasing Co., November 5, has been given the additional duties of assistant general manager of the crude-oil purchasing department, Standard Oil Co. (Indiana), effective January 1.

H. W. CAMP, manager, and W. W. SCHEUMANN, chief chemist, of the Cities Service Oil Co. in the Mid-Continent, made an inspection of the Okmulgee, Okla., refinery on Friday of last week and on their way from their Bartlesville offices made several business calls in Tulsa.

JOSEPH JENSEN, chief petroleum engineer of Tide Water Associated Oil Co., with offices in Los Angeles, and chairman of the mining committee of the Chamber of Commerce, presided at a meeting of members at which a round-table discussion considered bills pending before Congress affecting the mining and oil industries.

Do You Remember?

From The Oil and Gas Journal Files

25 YEARS AGO

That a process for increasing the amount of gasoline is practical is proved by the fact that Standard Oil Co. has had in operation, more or less successfully, a number of high pressure motor-spirits plants for the past 2 years.

Wichita Natural Gas 1 Stapleton, which found oil at 600 ft.:, near El Dorado, Kans., has penetrated 16 ft. of sand at 2,460 ft. and is making 45 bbl. at that depth.

20 YEARS AGO

Prairie Oil & Gas Co. announces a reduction in all purchases of crude of 30 per cent, effective December 14.

Fire destroyed the loading dock of the Humble Oil & Refining Co. at Baytown, Tex., causing a loss of $200,000.

M. L. Requa, vice president of the Sinclair companies warned oil men that they had a duty to perform in cooperating with the Government and if the industry failed to meet the issue it would find the Government stepping in.

10 YEARS AGO

A new type of topping unit has been installed at the Petty Island, New York, refinery of Crew-Levick Co., which has no condensers but cools heated vapors by means of heat transfers with the incoming crude.

The Joiner pool is thought to be finally proved and six new locations have been made. The lack of major-company interest in the field may help to prevent rapid drilling as there is no pipe-line outlet to the pool.

According to a Maryland court a gas pipe line is not a public utility and, therefore, has no right to condemn property for the construction of a pipe line through the state.

E. B. Reeser, president of the A.P.I., points out that the legislation proposed by the railroads to divorce pipe lines from integrated companies would not benefit the railroads nor any investor in railroads, pipe lines or utilities. It would merely add to the burden of the consumer.

HENRY N. TOLER, geologist with Southern Natural Gas Co., Jackson, Miss., went deer hunting in South Texas last week.

HARRY KELLY, refining division, and JAMES GREER, legal division, Gulf Oil Co., have returned from a trip to Venezuela.

G. J. OSSENTUJUK, head of the legal department, Caribbean Petroleum Co., sailed for Maracaibo, Venezuela, Friday, on the Grace liner Santa Rosa.

DR. PER K. FROLICH, director of chemical research, Standard Oil Development Co., discussed synthetics before the National Industrial Chemical Conference in Chicago last week.

E. A. HOLBEIN, New York, president of Standard Oil Co. of Pennsylvania, was in Shreveport, La., recently inspecting marketing facilities of the Standard Oil Co. of New Jersey subsidiaries in that area.

FRED E. WOOD, Chicago, petroleum engineer, will become assistant January 1 to A. W. PEAKE, vice president of Standard Oil Co. (Indiana) in charge of production. Mr. Peake is also president of the Stanolind company, southwestern producing subsidiary. Mr. Wood fills a position vacated by the death of R. H. Soper.

M. T. HALBOUTY, consulting geologist and petroleum engineer, Houston, Tex., addressed the South Louisiana Geological Society at the society's monthly meeting at Lake Charles, La., December 17. Mr. Halbouty discussed "Oil and Gas Stratigraphic Reservoirs in the University Field, East Baton Rouge Parish, Louisiana."

CURTIS W. MEADOWS, independent operator of Longview, Tex., was elected president of the Longview Chamber of Commerce the past week.

H. W. BREDENDICK, in charge of the Evansville, Ind., office of the Exchange Oil Co., underwent an emergency operation at St. Mary's hospital at Evansville a few days ago.

O. D. ROBINSON, president of the Republic Oil and Refining Co., at Pittsburgh, Pa., and D. W. HOVEY, vice president, with headquarters at Houston, Tex., left last week for a deer hunt in Southwest Texas.

COLONEL F. E. FOSTER, managing director, and DAVE KILGOUR, secretary of the California Oil and Gas Association, are completing preparations for the association's wildcat committee's annual Christmas jinks.

M. C. DORAN, of General Petroleum Corp., has been appointed foreman of the southern division of General Petroleum's pipe-line department, succeeding V. C. LARSEN, who was recently promoted to superintendent of the northern division.

ROBERT DONALDSON has been appointed chairman of the second annual gadget display of the California Natural Gasoline Association's Taft chapter. The first meeting last year at which many interesting gadgets were displayed was so successful that another meeting has been called.

M. H. CHAMPION resigned as traffic manager for Anderson-Prichard Oil Corp. and Coltex Refining Co., effective December 1. While he has not made definite announcement as to his future plans, he will continue as president of Petroleum Rail Shippers Association.

J. RUMSEY REEVE, supervisor of the Mid-Continent district of the United States Geological Survey, is temporarily in Washington, D. C., acting as chief oil and gas supervisor. R. B. SOYSTER, the chief, is in California assisting in preparing the Government's position in the Kettleman Hills trial to be held early in 1941. FOSTER MORRELL is acting Mid-Continent supervisor while Mr. Reeve is away.

Heads Refining Division

Election of Michael Halpern to the position of vice president in charge of refining for the Texas Co. in October is the latest promotion in a series of steps upward from the rank of assistant civil engineer at the Bayonne, N. J., terminal. During the 24 years Mr. Halpern has served the Texas Co. he has filled most of the intervening posts on the Gulf Coast and at the New York headquarters where he has been located since 1930.

MICHAEL HALPERN

Service with the Texas Co. started June 19, 1916, when Mr. Halpern was 24. His engineering career was built on the foundation of studies at Townsend Harris High School, New York, and graduation from the civil-engineering department of New York University. He was born in New York, September 15, 1892.

Mr. Halpern's first promotion was to the post of civil engineer at Bayonne on July 1, 1917, and he became assistant superintendent at the Providence, R. I., terminal January 28, 1921. He next became superintendent of the company's Delaware River terminal on January 8, 1923.

First direct contact with the company's Gulf Coast operations came in June 1925 when Mr. Halpern was appointed acting superintendent of Port Neches and on January 1, 1926, he became first assistant superintendent of the plant at that Texas city. He was transferred to Houston, Tex., May 1, 1926, and became auditor of operations for the refining department. On June 1, 1928, he was appointed second assistant superintendent of the Port Arthur, Tex., plant and on September 1, 1930, Mr. Halpern was returned to New York as assistant manager of the general refining department.

Seven years later, on February 15, 1937, Mr. Halpern was appointed manager of manufacturing and he was promoted to the office of general manager, refining department on September 1, 1938.

His experience includes that of acting director of the research department for a brief period before he became general manager of the refining division.

DR. L. HORWITZ of the Subterrex Co., at Houston, Tex., addressed the Houston Geological Society on "Geochemical Well Logging" at the society's weekly meeting the past week.

ROBERT A. STACY has announced that he will retire on January 1 as vice president of Delta Drilling Co., to enter business for himself. He will establish offices in Shreveport, La., and will engage in drilling contracting and oil producing.

DR. GEORGE H. ASHLEY, Pennsylvania state geologist, inspected terrain which has been the subject of a geological survey by DR. PARKE A. DICKEY, of Pleasantville, Pa., for the past year. Dr. Ashley also visited the Drake Well Memorial.

LLOYD A. SUMMERS, district production engineer for the Lago Petroleum Co., has returned to his headquarters in the Lagunillas field, Lake Maracaibo area of Venezuela, after spending a vacation period in Tulsa and other points of the Southwest.

DR. R. L. HUNTINGTON, head of chemical engineering at the University of Oklahoma, visited the Baton Rouge, La., refinery of the Standard Oil Co. on the return trip from New Orleans where he delivered a paper before the annual meeting of the American Society of Chemical Engineers.

JUDSON S. SWEARIGEN, of the chemical engineering department at the University of Texas, at Austin, Tex., delivered a paper on "An Electrical Device for Studying the Flow of Underground Fluids With Special Reference to Well Spacing on Recycling Projects" before the South Texas Geological Society at Corpus Christi the past week.

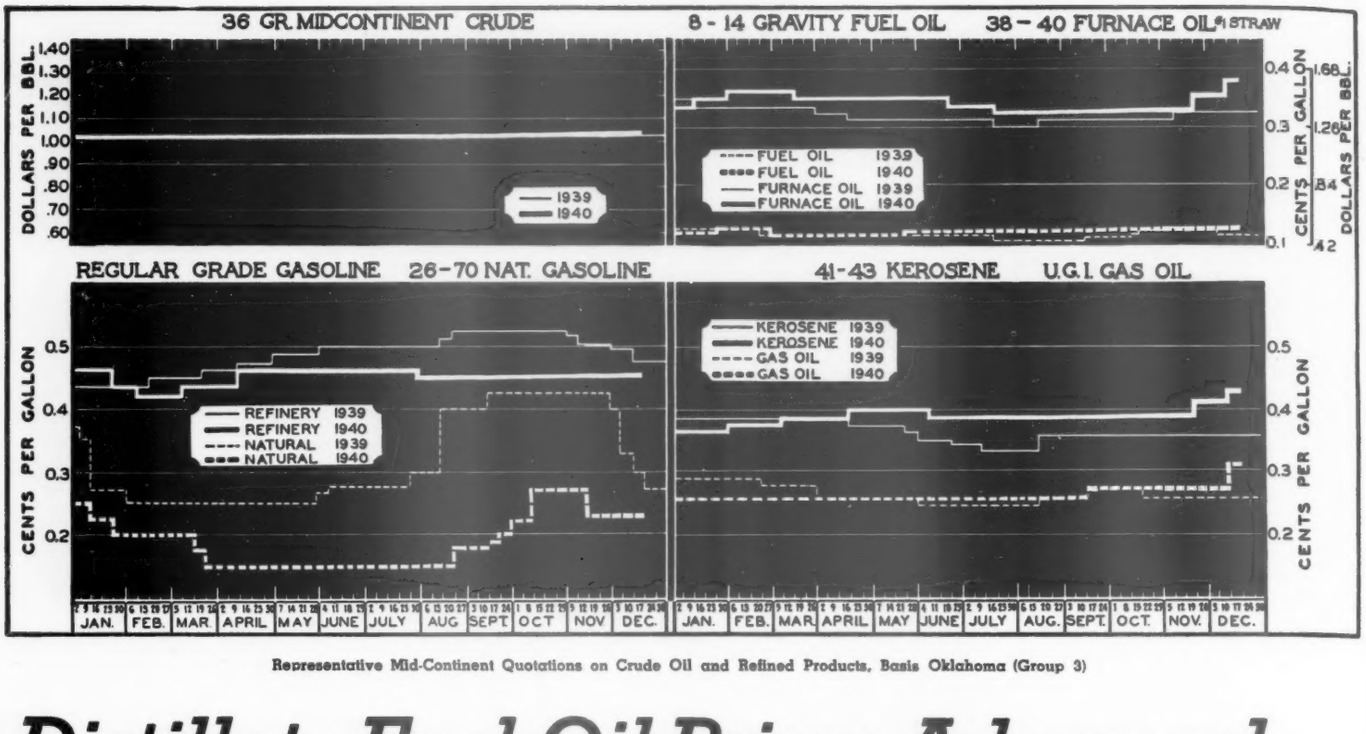
THOMAS G. ELDER, of Alton, Ill., has been appointed superintendent of manufacturing for National Refining Co. at Cleveland, Ohio. Mr. Elder started his refinery experience as a gager for Shell Oil Co., Inc., 22 years ago and became superintendent of that company's plant at Houston in 1929. In 1937, Mr. Elder became manager of the Shell's refinery at East Chicago and went to Wood River, Ill. as superintendent in 1938.

Shifts: W. B. CRUTCHER, superintendent, Pure Oil Co., from Ponca City, Okla., to Tulsa; E. A. ROSE, superintendent, Carter Oil Co. from Ponca City, Okla., to Oklahoma City, Okla.; JOHN E. McKITTRICK, engineer, Tex Harvey Oil Co., from McAllen, Tex., to Arroyo Grande, Calif.; F. C. HASTERT, engineer, Phillips Petroleum Co., from Phillips, Tex., to Seminole, Okla.; JOHN CUNNINGHAM, manager, Petroleum Sales Co., from San Antonio, Tex., to Harlingen, Tex.; R. J. WOLFE, drilling contractor, Long & Wolfe, from Tyler, Tex., to Houston, Tex.; R. F. CRUMLEY, JR., geologist, Phillips Petroleum Co., from Abbeville, La., to Houma, La.; POWELL A. DENNIE, engineer, Shell Oil Co., Inc., from McPherson, Kans., to Wichita Falls, Tex.; WILLIAM C. RODGERS, engineer, Philips Petroleum Co., from Oklahoma City to Armored Force School Detachment, Fort Knox, Ky.

DR. LUTHER C. SNIDER, president of the American Association of Petroleum Geologists, and recently consulting geologist for Cities Service Oil Co., New York City, has been added to the staff of the University of Texas in Austin, Tex. Dr. Snider will assume his duties as professor of geology at the university on January 1, 1941, and will arrive in Austin in time to attend the annual meeting of the Geological Society of America to be held on the University campus December 26-28. He served for 6 years as assistant director and geologist with the Oklahoma Geologic Survey.

GEORGE A. WEAVER, geologist with Pure Oil Co., has been transferred to the Fort Worth office from Roswell, N. M., where he has been located for the past 1½ years. He has been with Pure Oil Co. for the past 15 years, spending most of that period with the company in East Texas and Louisiana.

L. S. MELZER, scout for the Stanolind Oil & Gas Co., and formerly stationed at Midland, Tex., to scout the North Permian basin and New Mexico, has been transferred to the Fort Worth office of the company where he will scout the Fort Worth basin area of North Texas. G. G. GALLIGAN, formerly in the Fort Worth office and scout for the Fort Worth basin, will succeed Mr. Melzer in the West Texas district.



Representative Mid-Continent Quotations on Crude Oil and Refined Products, Basis Oklahoma (Group 3)

Distillate Fuel-Oil Prices Advanced Eighth Cent by Group 3 Refiners

By H. STANLEY NORMAN

THE interior market for light fuel oils moved ahead another eighth of a cent per gallon this week responding to the demand created by the cold wave which gripped the Middle West. Tank-car quotations in the Group 3 refinery area and in the Chicago market for kerosene and most grades of distillate reacted to the demand. Marketers have no fear but that the new distillate prices are still on firm ground and are already talking about higher prices for January and February.

Wisconsin, Minnesota, Michigan and northern Illinois are the territories from which came the most insistent fuel-oil demand. Suppliers in the Group 3 territory were attempting to meet urgent shipping instructions. There is no basis for considering the current market to have reached runaway proportions but there is no denying that it is active and trending higher.

Market Slack Absorbed

The eighth of a cent added to the tank-car market appears to confirm the indications of 3 weeks ago when the tank-wagon quotations were advanced a quarter cent in the large consuming centers of the Middle West. The double-jump rise in tank-wagon prices produced a lag of an eighth of a cent in tank-car quotations. The slack between the tank-wagon and tank-car markets has been taken up for the moment.

Distributors in the northern states are reported considering another advance in tank-wagon prices. Extent and severity of the cold wave will determine the market moves over the next few weeks.

Zero and subfreezing temperatures accompanied by heavy snows in most of the northern states caused a reduction in motor-fuel demand. Group 3 refiners are still shipping substantial quantities of gasoline at unchanged prices but the volume is obviously curtailed in comparison with business in the last half of November and October.

General quotations for gasoline in the Mid-Continent refining district are unchanged but the market lacks precision and form. Buyers are able to obtain supplies at prices substantially below the market if they are willing to forego standard specifications.

The residual market in Chicago and other middle western industrial cities is strong and supplies are limited in most directions. Expansion of consumption is developing rapidly in areas where the manufacture of military defense materials is just now reaching the production stage.

Colder weather in several sections drawing supplies from the inland refining and producing districts stimulated the consumption and demand for natural gasoline. Prices are unchanged at the base figures of 2 cents in North Texas and 2.25 cents per gallon in Oklahoma for 26-70 material. The intrastate market varies from an eighth to a quarter of a cent higher in Oklahoma and Kansas for operators of natural plants favorably located near refineries. Considerable natural gasoline is still moving to the Gulf Coast section, particularly to Corpus Christi, indicating that the coastwise movement of winter-grade gasoline has settled to routine for the season.

Transportation Growing Factor

Growing interest is focused on the question of transportation costs. The reduction in rates applying to distillates from the Middle West to the Atlantic seaboard implies that Mid-Continent stocks may become a more important factor in the future, particularly if tanker rates from the Gulf Coast are maintained or pushed into higher ground.

Mid-Continent refiners are seeking a reduction in rail rates to the Mississippi River comparable to one already granted from that division east. A rate of 25 cents per 100 lb. becomes effective December 20 from St. Louis to Baltimore, down 1.5 cents. The rate from Oklahoma to St. Louis is now 26.5 cents per 100 lb., meaning that deliveries to Baltimore can be made at the rate of 51.5 cents from December 20 forward.

The rates from Oklahoma east will remain too high for direct competition with Gulf Coast fuels. There is a possibility, however, that fuels produced along the Mississippi may move east in direct competition with other sources of supply and in turn local demand may be diverted elsewhere. Tanker rates are now the key to markets.

Refined Oil Market Barometer

Distillate fuel-oil prices gained another eighth of a cent per gallon this week in the inland refined market. Refiners elevated their asking prices in view of the apparently insatiable demand from the Middle West, where the last cold wave was most severe. Most other products are unchanged. Gasoline movement tapered off but natural-gasoline demand is showing more spirit.

MID-CONTINENT: Lubricating-oil manufacturers anticipate an early advance.

GULF COAST: Spot market for all products is dormant. Absence of inquiries has softened the market.

CALIFORNIA: The low side of the residual fuel-oil market was elevated 5 to 10 cents per barrel.

PENNSYLVANIA: Heavy demand for lubricating oils brought another crude advance.

CHICAGO: Tank-car fuel-oil prices moved up an eighth in sympathy with primary markets.

Fuel-Oil and Kerosene Markets Continue Climb on East Coast

By J. P. O'DONNELL

NEW YORK, Dec. 17.—Fuel oil and kerosene continued to improve in the eastern refined market last week with one major refiner elevating prices on No. 2 fuel oil to 5.1 cents per gallon and kerosene to 5.5 cents, an increase of 0.2 cent in each product. However, both fuel oil and kerosene are reported obtainable at 4.9 and 5.3 cents per gallon, respectively.

Current prices on No. 2 fuel oil are from 0.1 to 0.3 cent higher than at the corresponding period of last season, reflecting the increased demand of the current season and the higher transportation rates from the Gulf. Gulf-to-north-of-Hatteras tanker rates remained firm last week. Clean-tanker rates were unchanged but the dirty-tanker rate on fuel oil was raised 5 cents to 65 cents per barrel by the chartering of the 3,105-ton Castana for January loading. Clean-tanker charters reported were all on the basis of 70 cents for gasoline, 75 cents for kerosene and 80 cents for light heating oil.

Moderation of the weather in the latter part of the week undoubtedly eased the pressure on fuel-oil suppliers but stock withdrawals continued heavy. Stock reductions on the East Coast totaled 794,000 bbl. in the first full week of December and brought the total down to 15,688,000 bbl., off 2,756,000 bbl. from the seasonal peak reached October 18. The inroads on inventories continued despite the heavy shipments from the Gulf in November and on December 7, East Coast stocks were but 4,201,000 bbl. above their level of the year before, about two-thirds of the margin that existed when the fuel-oil season was ushered in. Further price improvement is envisioned as this margin decreases.

Gasoline prices were unchanged last week with most suppliers asking 5.5 to 5.75 cents per gallon for material in the 72-74-octane range. Gasoline prices have firmed up but have shown little improvement despite the fact that tanker rates from the Gulf are 8 cents higher than a year ago and 7 cents above previous all-time highs. In addition the statistical position of gasoline on the East Coast is the strongest in more than a year. Further withdrawals from storage were reported in the first week of December and stocks were reported down to 17,325,000 bbl., almost a million barrels less than they were a year ago. Thus, despite the improved statistical position and the higher transportation rates, current prices of from 5.5 to 5.75 cents are lower than the 6.75 to 7.75 quotations that ruled in mid-December a year ago.

Medium and heavy fuel oils have likewise failed to reflect the high tanker rates, probably because of the fact that ample supplies exist on the East Coast. No. 3 fuel oil has advanced but No. 5 and Bunker C remain at previously quoted levels, $1.45-$1.55 and $1.15-$1.25, respectively.

Refinery and terminal advances of the past few weeks have been reflected in similar increases in prices quoted for tank-wagon and other forms of delivery. Standard Oil Co. of New Jersey advanced its tank-wagon quotations on kerosene and fuel oil in New Jersey last week 0.2 cent per gallon, making them 8.1 cents for kerosene, 8.1 cents for No. 1 fuel oil, and 6.9 cents for both No. 2 and No. 3 at all points. Socony-Vacuum Oil Co., Inc., made similar advances throughout the metropolitan New York district which extends as far north and east as Stamford, Conn.

Recent advances in diesel-oil prices apparently are well maintained as demand is reported to be very good, and there are some observers who anticipate additional advances in the near future. Shore deliveries are reported to have entirely offset losses which some suppliers report in bunkering demand. The current quotations are firm at 4.7 cents per gallon for shore delivery and at $1.95 for bunkering.

The softness which has been apparent in the wax market in recent weeks apparently has been removed or at least tempered and prices are reported comparatively firm at 2.6 to 2.75 cents per pound for both 124-26 A.m.p. white and yellow scale grades. Fully refined grades are unchanged at prices which have prevailed for months, ranging from 5½ cents on the 123-25 A.m.p. grade to 6.1 cents per pound on 133-35 A.m.p. grade.

Canada has placed brakes on imports of refined-oil products. Canada is currently one of the three major importers of lubricating oils produced in this country and loss of this market would be a blow. In October the United Kingdom led in importing American lubes, taking 150,000 bbl. while Japan took 144,500 bbl. and Canada, 57,300 bbl.

The possibility of a complete embargo on Japan, however, is of even greater significance for, as the report of the Department of Commerce on October exports shows, the dominant Asiatic country took more than twice as much lubricating oil from this country. Japanese imports of American lubricating oils are on the increase, her October total running 21,400 bbl. higher than in September. In addition, October exports to Japan compare with 72,417 bbl. a year ago, an increase of an even 100 per cent.

The Pennsylvania market is reflecting the effect of the increased coastwise tanker rates, with some refiners quoting higher prices for fuel oil. This situation has been particularly favorable to refiners in the northern Pennsylvania area who have better freight rates to principal consuming markets affected by the tanker-rate advance than the lower district refiners.

Gulf Coast Markets

HOUSTON, Tex., Dec. 16.—Except for material moving on contract to the regular domestic trade, the Gulf Coast refinery market at the opening of the week was at a virtual standstill. No spot market sales, or even inquiries of any kind, were reported. A little gasoline was reported moved from Corpus Christi during the past week but for several days there has been only hopeful waiting with little in prospect for immediate relief.

Despite this, however, sellers still are attempting to maintain quotations for all products on a firm basis, but without any important spot-market business or inquiries there is little upon which to base a true market. It is admitted that a buyer with a bona fide order of sufficient volume might be able to break the existing quotations. However, quotations of all products for some time have been below actual costs, and there is little to be gained by further cutting of prices, unless it is a question of forced moving of material, a position which most sellers are not in at this time, judging from current stock inventories.

Kerosene seems to be the principal product in which definite further weakening of prices is developing. Even with kerosene there is not an excessive supply, considering the overall picture. Most refiners do not have a large supply, but there are a few sources that do have to move material, it is reported. Although quotations generally range from 3¾ cents, those few sources are reported as willing to take an eighth-cent less.

It also is reported that No. 2 fuel can be bought at 3⅛ cents, which is an eighth cent below prevailing low quotations. However, this product is

(Continued on Page 95)

A.P.I. Weekly Refinery Statistics

Week Ended December 14, 1940

	Capacity reporting (per cent)	Total gasoline stocks (bbl.)	Residual fuel-oil stocks (bbl.)	Gas oil and distillate stocks (bbl.)	Daily crude runs (bbl.)
East Coast	100.0	17,046,000	11,446,000	15,504,000	570,000
Appalachian	91.0	3,257,000	301,000	513,000	123,000
Ind., Ill., and Ky.	90.2	13,681,000	2,946,000	4,756,000	524,000
Okla., Kans., and Mo.	76.9	6,709,000	2,137,000	1,343,000	254,000
Inland Texas	59.6	1,698,000	1,568,000	414,000	116,000
Texas Gulf	89.2	13,189,000	8,496,000	8,504,000	874,000
Louisiana Gulf	97.6	2,733,000	2,212,000	1,528,000	138,000
N. Louisiana and Ark.	51.5	503,000	458,000	316,000	44,000
Rocky Mountains	56.0	973,000	409,000	146,000	39,000
California	87.3	15,665,000	72,342,000	10,026,000	472,000
Total reported	86.2	75,454,000	102,315,000	43,050,000	3,154,000
Est. unreported	.....	5,780,000	1,790,000	885,000	341,000
*Est. total	.....	81,234,000	104,105,000	43,934,000	3,495,000
*Est. total previous wk.	.....	81,062,000	105,353,000	44,305,000	3,460,000
*Dec. 15, 1939	.....	79,534,000	108,219,000	36,005,000	3,415,000

*Bureau of Mines.

Stocks of Crude Oil in the United States

(BUREAU OF MINES ESTIMATE)

Week ended December 7, 1940	261,152,000 barrels
Week ended November 30, 1940	262,679,000 barrels
Week ended December 9, 1939	232,016,000 barrels

Figures do not include stocks of heavy, unrefinable California crude.

RETAIL OIL MARKETS...

Tank-wagon and filling-station prices on gasoline and kerosene furnished by larger marketing firms

Prices as of December 17, 1940

Taxes

The gasoline quotations given in the following tables include the 1½-cent federal tax, as well as state, county, and city taxes. The gasoline is the regular or standard grade. In most areas lower grades and a premium grade also are available.

Standard Oil Co. (Indiana)

	Gasoline Tank wag.	Dlr.	Incl. tax	Kero. tank wag.
Chicago, Ill.	14.6	12.6	4.5	10.0
Decatur	14.6	13.1	4.5	9.5
Joliet	15.6	14.1	4.5	10.0
Peoria	15.6	13.2	4.5	10.0
Quincy	15.4	13.9	4.5	9.8
Davenport, Ia.	15.6	14.1	4.5	‡10.0
Des Moines	15.4	13.9	4.5	‡9.8
Mason City	15.8	14.3	4.5	‡10.2
Duluth, Minn.	16.4	14.9	4.5	10.8
Mankato	16.0	14.5	4.5	9.0
Minneapolis	16.0	14.2	4.5	10.4
LaCrosse, Wis.	17.0	15.5	5.5	10.4
Green Bay	17.4	15.9	5.5	10.3
Milwaukee	16.8	15.3	5.5	10.2
Detroit, Mich.	14.1	12.6	4.5	7.6
Grand Rapids	14.3	12.8	4.5	9.1
Saginaw	14.9	13.4	4.5	9.1
Evansville, Ind.	16.6	15.1	5.5	†9.8
Indianapolis	16.8	14.8	5.5	†10.0
South Bend	16.8	15.3	5.5	†10.0
Fargo, N. D.	18.2	16.7	5.5	11.6
Huron, S. D.	17.5	16.0	5.5	10.9
Kans. City, Mo.*	14.8	11.8	4.5	8.0
St. Louis*	14.7	13.2	4.5	9.0
St. Joseph	14.9	13.0	4.5	7.9
Wichita, Kans.	13.8	12.3	4.5	6.5

*State tax 2 cents, 1-cent city tax, and 1½-cent federal tax. †Does not include 4-cent state tax. ‡Does not include 3-cent state tax.

Exclusive of state general sales taxes.

Discounts to commercial consumers: On purchases per month off tank-wagon prices: 1,000 gal. or more, 1.5 cents off; minimum delivery 25 gal.

Stanolex Fuel Oil in Chicago

Effective Dec. 2, 1940, f.o.b. Chicago, tank-wagon prices: Standard heater oil, 1-99 gal., 9.0 cents; 100-149 gal., 8.0 cents; 150 gal. and over, 7.5 cents. Stanolex fuel oil No. 1, 1-99 gal., 8.5 cents; 100-399 gal., 7.5 cents; 400 gal. and over, 7.0 cents. Stanolex furnace oil, 1-99 gal., 8.5 cents; 100-399 gal., 7.5 cents; 400 gal. and over, 7.0 cents. Stanolex fuel oil A, 1-399 gal., 6.0 cents; 400-799 gal., 5.0 cents; 800 gal. and over, 4.75 cents. Stanolex fuel oil B, 1-399 gal., 6.0 cents; 400-799 gal., 5.0 cents; 800 gal. and over, 4.75 cents. Stanolex Bunker C fuel oil, 1-999 gal., 4.75 cents; 1,000 gal. and over, 3.75 cents.

Ohio

STANDARD OIL CO. OF OHIO

	Gasoline Cons'r tank wag.	Dlr. vided dlr.	Incl. tax	Kero. tank wag.
Ohio points	16.0	15.0	5.5	*9.0

*Includes state tax of 1 cent.

Atlantic Coast District

STANDARD OIL CO. OF NEW JERSEY

	Gasoline Cons'r tank car	Dlr. tank wag.	Incl. tax	Kero. tank wag.
Atlantic City	11.00	12.60	4.5	8.1
Newark	11.00	12.60	4.5	8.1
Annapolis, Md.	12.85	14.35	5.5	9.5
Baltimore	12.25	13.75	5.5	8.5
Cumberland	13.65	15.15	5.5	10.0
Washington, D.C.	10.50	12.00	3.5	9.5
Danville, Va.	14.45	16.95	6.5	9.0
Norfolk	13.25	15.75	6.5	10.5
Petersburg	13.55	16.05	6 5	11.2
Richmond	13.55	16.05	6.5	10.5
Roanoke	14.75	17.25	6.5	11.0
Charles'n, W. Va.	14.05	16.55	6.5	12.6
Parkersburg	13.35	15.85	6.5	11.2
Wheeling	14.35	16.85	6.5	11.8
Charlotte, N. C.	16.40	15.00	7.5	10.3
Hickory	16.95	18.45	7.5	10.8
Mt. Airy	16.80	16.00	7.5	10.7
Raleigh	16.15	16.00	7.5	10.0
Salisbury	16.45	14.50	7.5	(*)
Charleston, S. C.	14.25	16.75	7.5	9.25
Columbia	15.10	17.60	7.5	(*)
Spartanburg	15.80	18.30	7.5	12.2

Price basis to Essolene undivided dealers: Dealer tank-wagon price less 0.5 cent per gallon. Price basis to commercial consumers, effective March 8, 1937, in Maryland, District of Columbia, and in Arlington and Fairfax counties in Virginia; and March 12 in New Jersey: To contract accounts purchasing at least one full compartment at a time by hose connection, on yearly purchases: From 2,500 to 100,000 gal., consumer tank-wagon price at time and place of delivery; 100,000 gal. per year, consumer tank-car price plus 0.5 cent per gallon. Consumer tank-wagon price generally will be equivalent to dealer tank-wagon price less 0.5 cent per gallon.

Effective January 16, 1939, in North Carolina the commercial consumer schedule became as follows: Single deliveries of 50 gal. or more, consumer tank-wagon price. Single deliveries of less than 50 gal., 4 cents per gallon over consumer tank-wagon price. Generally the posted consumer tank-wagon price will be equivalent to the dealer price, less 0.5 cent per gallon. The above policy also applies in South Carolina, effective January 23, 1939.

*Kerosene business of the company at these points now exclusively handled by dealers.

Southern District

STANDARD OIL CO. (KENTUCKY)

	Gasoline Cons'r tank wag.	Net dlr.	Incl. tax	Kero. tank wag.
Atlanta, Ga.	14.0	14.0	7.5	8.0
Augusta	16.5	16.5	7.5	9.5
Macon	15.0	15.0	7.5	9.0
Savannah	15.5	15.5	7.5	9.0
Birmingham, Ala.	16.5	16.5	8.5	9.0
Mobile	15.5	15.5	9.5	8.0
Montgomery	18.0	18.0	9.5	10.0
Jackson, Miss.	16.0	16.0	7.5	9.0
Vicksburg	15.5	15.5	7.5	8.5
Jacksonville, Fla.	16.0	16.0	8.5	8.0
Miami	16.0	16.0	8.5	8.0
Pensacola	17.0	17.0	9.5	8.0
Tampa	16.0	16.0	8.5	8.0
Lexington, Ky.	15.5	15.5	6.5	9.0
Covington	13.5	13.5	6.5	9.0
Louisville	15.0	15.0	6.5	8.5
Paducah	13.0	13.0	6.5	8.5

Price basis to tank-wagon consumers, effective January 4, 1937, 3 cents per gallon below tank-wagon price.

Montgomery, Ala., has a county tax of 1 cent per gallon, and a city tax of 1 cent per gallon on gasoline, in addition to state tax, and 1 cent per gallon on kerosene. Mobile, Ala., has a city gasoline tax of 2 cents per gallon; Birmingham, Ala., has a city gasoline tax of 1 cent per gallon; Pensacola, Fla., has a city gasoline tax of 1 cent. All are included in the table.

Pennsylvania and Delaware

ATLANTIC REFINING CO.

	Gasoline Cons'r tank car	Dlr. tank wag.	Incl. tax	Kero. tank wag.
*Philadelphia, Pa.	12.5	13.5	5.5	10.0
Pittsburgh	13.0	15.0	5.5	10.5
Allentown	13.0	14.5	5.5	10.5
Erie	12.5	15.0	5.5	10.0
*Scranton	11.9	12.4	5.5	10.5
Altoona	13.0	15.0	5.5	10.5
Dover, Del.		14.0	5.5	10.5
Wilmington		13.5	5.5	10.0

Price basis to undivided dealers, dealer tank-wagon price less 0.5 cent per gallon.

Discount on kerosene, 2 cents per gallon off tank-wagon price on tank-wagon deliveries of 25 gal. or more at one time.

*Voluntary discount of 1 cent allowed to dealers only.

Pacific Coast Territory

STANDARD OIL CO. OF CALIFORNIA

	Gasoline Tank truck	Serv. sta.	Incl. tax	Kero. tank wag.
San Francisco	16.5	17.5	4.5	11.5
Los Angeles	16.0	17.0	4.5	10.0
Fresno, Calif.	17.5	18.5	4.5	12.5
Phoenix, Ariz.	20.5	21.5	6.5	*17.5
Reno, Nev.	19.5	20.5	5.5	13.5
Portland, Ore.	19.0	20.0	6.5	13.5
Seattle, Wash.	19.0	20.0	6.5	13.5
Spokane	20.5	21.5	6.5	16.5
Tacoma	19.0	20.0	6.5	13.5

*Includes 5-cent state tax.

Discount to dealers: On gasoline, off tank-wagon price, to 100 per cent dealers, 3 cents. To commercial consumers: On tank-wagon price; on single deliveries of 40 gal. and over, advance quantity discount extended at time of delivery, 3 cents. Service-station schedule applies on single deliveries less than 40 gal. On kerosene in tank-car, transport-truck, and trailer delivery, 3 cents off tank-wagon price; plant deliveries to jobbers, 2.5 cents below tank wagon.

March 18, 1939, split dealer discount was canceled.

New York and New England

SOCONY-VACUUM OIL CO., INC.

	Gasoline Cons'r tank car	Dlr. tank wag.	Incl. tax	Kero. tank wag.
Albany	12.2	13.2	5.5	8.0
*Met. New York, Manhat., Bronx, Queens, Brklyn., Staten Island	11.9	12.0	5.5	8.1
Buffalo	12.4	13.4	5.5	7.9
Rochester	12.8	13.4	5.5	8.5
Syracuse	12.5	11.2	5.5	8.9
Portland, Me.	11.7	11.7	5.5	8.4
Manchester, N.H.	12.8	12.6	5.5	9.2
Burlington, Vt.	12.8	13.5	5.5	8.6
Boston, Mass.	10.7	11.7	4.5	8.4
Worcester	11.3	12.0	4.5	8.5
Hartford, Conn.	11.5	12.0	4.5	7.9
New Haven	11.2	11.8	4.5	7.4
Providence, R. I.	10.7	12.2	4.5	8.4

*Does not include 2 per cent city sales tax, which is calculated on basis of net retail price exclusive of state and federal taxes. Metropolitan New York prices are undivided dealer prices; others are split dealer.

Effective August 8, 1940, the company changed its commercial consumer policy in New York and New England to the following:

Full compartment deliveries: Accounts buying less than 20,000 gal. annually, 0.5 cent above the commercial-consumer price; accounts buying from 20,000 to 120,000 gal. annually, commercial-consumer price; accounts buying 120,000 gal. annually and above, 0.25 cent off consumer price. Split compartment deliveries: Delivery of less than a full compartment, 250 gal., commercial-consumer price plus 1 cent. Steel-barrel deliveries: Commercial price plus 3 cents.

Rocky Mountain District

CONTINENTAL OIL CO.

	Gasoline Tank wag.		Incl. tax	Kero. tank wag.
Denver, Colo.	14.5	...	5.5	10.5
Grand Junction	16.5	...	5.5	12.0
Pueblo	15 5	...	5.5	9.0
Casper, Wyo.	16.5	...	5.5	11.5
Cheyenne	14.5	...	5.5	11.0
Billings, Mont.	16.5	...	6.5	12.0
Butte	15.5	...	6.5	13.0
Great Falls	15.5	...	6.5	12.0
Helena	15.5	...	6.5	12.5
Salt Lake, Utah	16.0	...	5.5	14.0
Boise, Idaho	†18.6	...	6.5	16.0
Twin Falls	†19.6	...	6.5	16.5
Albu'que, N. M.	*16.0	...	7.0	9.5
Roswell	*14.0	...	7.0	8.0
Santa Fe	‡17.0	...	7.5	9.5

*Includes city tax of 0.5 cent. †Includes toll-bridge tax of 1 mill. ‡Includes city tax of 1 cent.

Tank wagon represents price to consumers. Dealer represents price to dealers. If no dealer price is quoted, the tank-wagon price applies to all classes of trade.

Central South District

STANDARD OIL CO. OF LOUISIANA

	Gasoline Cons'r tank car	Dlr. tank wag.	Incl. tax	Kero. tank wag.
New Orleans, La.	14.25	16.75	8.5	†11.0
Baton Rouge	14.75	17.25	8.5	‡10.5
Alexandria	14.75	17.25	8.5	‡10.5
Lafayette	15.00	17.50	8.5	‡10.0
Lake Charles	14.75	17.25	8.5	‡10.0
Shreveport	14.00	16.50	8.5	10.0
Knoxville, Tenn.	18.00	20.00	8.5	12.5
Memphis	16.00	18.00	8.5	11.0
Chattanooga	17.50	17.35	8.5	12.0
Nashville	17.00	17.50	8.5	11.0
Bristol	18.25	18.75	8.5	12.0

Essolene at dealer price less 0.5 cent per gallon to undivided dealers.

†Includes 1-cent parish tax and 1-cent state tax. ‡Includes 1-cent state tax.

Price basis to commercial consumers: Effective May 15, 1937, deliveries of 50 gal. or more in one territory take posted consumer tank-wagon price. Accounts taking deliveries of less than 50 gal. at one time pay posted consumer tank-wagon price plus 4 cents per gallon. Generally, the posted consumer tank-wagon price will be equivalent to the dealer price less 0.5 cent per gallon. Kerosene prices include 1-cent state tax.

Effective February 24, 1939, the company reestablished in New Orleans the commercial consumer policy on motor fuel effective in the rest of the state.

Effective December 12, 1938, the company revised its commercial consumer policy on motor fuel in New Orleans, as follows: Single deliveries of less than 50 gal., consumer tank car plus 2 cents per gallon 50 to 199 gal., consumer tank car plus 1 cent per gallon; 200 gal. and over, consumer tank car plus 0.5 cent per gallon.

Oklahoma and Arkansas

CONTINENTAL OIL CO.

	Gasoline Tank wag.	Incl. tax	Kero. tank wag.
Texarkana, Ark.	13.5	5.5	6.0
Fort Smith	13.5	5.5	6.5
Little Rock	16.0	8.0	8.0
Muskogee, Okla.	13.5	5.5	7.0
Oklahoma City	12.5	5.5	6.5
Tulsa	12.5	5.5	6.0

Tank wagon represents price to consumers. If no dealer price is quoted, the tank-wagon price applies to all classes of trade.

Nebraska

STANDARD OIL CO. OF NEBRASKA

	Gasoline Tank wag.	Dlr.	Incl. tax	Kero. tank wag.
Omaha	17.4	15.9	6.5	9.5
McCook	17.0	14.4	6.5	9.0
Norfolk	17.5	15.4	6.5	9.9
North Platte	17.8	15.5	6.5	10.2
Scottsbluff	17.4	14.5	6.5	10.8

Discounts to commercial consumers for tank-wagon deliveries covered only by standard commercial consumers contract, effective January 1, 1935.

Texas

	Gasoline Tank wag.	Dlr.	Incl. tax	Kero. tank wag.
Dallas, Tex.	11.5	15.5	5.5	6.0
Fort Worth	11.5	15.5	5.5	7.0
Houston	12.0	16.0	5.5	8.0
San Antonio	12.5	17.0	5.5	8.0

Naphtha

STANDARD OIL CO. (INDIANA)

	Tank wagon*
Oleum spirits	16.2
V.M.&P. naphtha	16.5
Cleaners' naphtha	15.5
Stanisol	15.5

*Prices include 3-cent Illinois tax but not 1-cent federal tax nor 2 per cent retail occupational tax.

Prices f.o.b. Chicago. Each price subject to discount of 1 cent per gallon for 150-gal. lots if covered by contract.

Canada*

3-Star Imperial Gasoline

IMPERIAL OIL, LTD.

	Gasoline Tank wag.	Incl. tax	Kero. tank wag.
Halifax, N. S.	24.5	10.0	18.0
St. John, N. B.	24.5	10.0	18.0
Montreal, Que.	24.0	8.0	16.5
Toronto, Ont.	24.5	8.0	17.0
Hamilton, Ont.	24.5	8.0	17.0
Winnipeg, Man.	27.5	7.0	22.5
Brandon, Man.	28.0	7.0	22.5
Regina, Sask.	25.0	7.0	20.0
Saskatoon, Sask.	28.0	7.0	23.0
Edmonton, Alta.	25.9	7.0	20.0
Calgary, Alta.	23.0	7.0	18.0
Vancouver, B. C.	21.0	7.0	23.0

*Imperial gallon used in Canada.

Divided dealers pay tank-wagon prices. Discount to undivided dealers, 1 cent below tank-wagon price. In Maritime Provinces both divided and undivided dealers pay tank-wagon price.

Tank-Wagon Changes

Standard Oil Co. of New Jersey advanced the tank-wagon price for fuel oils in the State of New Jersey 0.2 cent per gallon effective December 12. The advance makes kerosene and No. 1 fuel oil posted at 8.1 and No. 2 and No. 3 fuel, 6.9 cents per gallon.

The Texas Co. reduced its dealer tank-wagon price 1 cent in Texas, December 13.

PRICES OF REFINED PRODUCTS...

All quotations f.o.b. plant in cars for interstate or export movement except as otherwise noted

Prices as of December 17, 1940

The quotations are exclusive of the federal excise taxes of 1 cent a gallon on gasoline and 4 cents a gallon on lubricating oils. Octane ratings in Middle West, Mid-Continent, and Southwest are based on A.S.T.M. method of testing.

Refinery Gasoline

OKLAHOMA (Group 3)—

U. S. Motor grades:		
72-74 octane (regular)	.04½	.04¾
63-66 octane	.04	.04¼
60 octane and below	.03¾	.04
60-62 400 grades:		
72-74 octane (regular)	.04½	.04¾
63-66 octane	.04¼	.04⅜
60 octane and below	.03¾	.04

NORTH TEXAS—

U. S. Motor grades:		
72-74 octane (regular)	.04½	.04¾
63-66 octane	.04	.04¼
60 octane and below	.03¾	.04
60-62 400	.03¾	.04⅛

NORTH LOUISIANA (Ark. and N. La. delivery)—

U. S. Motor grades:		
72-74 octane (regular)	.04½	.04⅞
63-66 octane	.04¼	.04½
60 octane and below	.03⅞	.04⅛

ARKANSAS (Ark. and N. La. del.)—

U. S. Motor grades:		
72-74 octane (regular)		.04¾
60 octane and below		.04

CHICAGO (Based on Group 3)—

U. S. Motor grades:		
72-74 octane (regular)	.04½	.04⅞
63-66 octane	.04⅛	.04½
60 octane and below	.03¾	.04⅛
60-62 400 grades:		
72-74 octane (regular)	.04½	.04⅞
63-66 octane	.04⅛	.04½
60 octane and below	.03¾	.04⅛

PENNSYLVANIA (inland refineries)—

74-76 octane (regular)		.06
72-74 octane		.05¾

CALIFORNIA (domestic movement)—

58-60 400, 65 oct. and higher	.05½	.07½
54-58 U. S. Motor	.04½	.06¼

EAST COAST (domestic)—

U. S. Motor grades:		
New York (Bayonne)*	.05½	.06½
Philadelphia	.05½	.07
Boston	.05½	.06
Baltimore	.05½	.06¾
Charleston, S. C.	.06½	.07

*All grades of gasoline ⅛ to ¼ cent less for barge shipments. New York Harbor prices are for New York and New England delivery. Prices for New Jersey delivery ¼ cent lower.

GULF COAST (domestic)—

U. S. Motor grades:		
72-74 octane		.03½
70-72 octane	.03¼	.03½
68-70 octane		.03¼
65-67 octane	.03⅛	.03¼

Natural Gasoline

OKLAHOMA (Group 3)—

Grade 26-70		.02⅛
Grade 18-55	.02⅝	.02¾

NORTH TEXAS—

Grade 26-70		.02
Grade 18-55		.02⅝

CALIFORNIA—

75-85 375-390	.04½	.05¼

NORTH LOUISIANA (Ark. and N. La. delivery)—

Grade 26-70		.02

Tractor Fuel

OKLAHOMA (Group 3)—

40-42 gr., 315-325 l.b.p., 110-flash, 540-550 e.p.	.03½	.03⅝
41-43 gr., 300-320 l.b.p., 110-125 flash, 500-520 e.p.	.03⅝	.03¾
46-48 gr., 210-230 l.b.p., 480-max., e.p.	.03⅞	.04

Kerosene

(All kerosene water white)

OKLAHOMA (Group 3)—

42-44	.04⅛	.04¼
41-43	.04	.04⅛

NORTH TEXAS—

41-43	.03⅞	.04

NORTH LOUISIANA (Ark. and N. La. delivery)—

41-43	.03⅞	.04

ARKANSAS (Ark. and N. La. del.)—

41-43	.04	.04¼

PENNSYLVANIA (inland refineries)—

46	.05	.05¼
45	.05	.05½

CHICAGO (Based on Group 3)—

42-44	.04	.04¼
41-43	.03⅞	.04⅛

CALIFORNIA (Pac. Coast market)—

38-43 high burning test	.04½	.05½

NEW YORK (Bayonne, N. J.)—

41-43	.053	.055

GULF COAST (domestic)*—

41-43	.03¾	.04

*Barge price ⅛ cent lower.

Furnace Oil

OKLAHOMA (Group 3)—

Range oil	.03⅞	.04
No. 1 prime white, 38-42	.03¾	.03⅞
No. 1 straw, 38-40	.03⅝	.03¾
[illegible] 36	.03½	.03⅝
No. 3 zero to 10, 28-32	.03⅜	.03½

NORTH TEXAS—

No. 1 prime white, 38-42	.03⅝	.03¾
No. 1 straw, 38-40	.03½	.03⅝

NORTH LOUISIANA (Ark. and N. La. delivery)—

No. 2, 32-36	.03½	.03⅝

ARKANSAS (Ark. and N. La. del.)—

No. 2, 32-36	.03½	.03⅝

CHICAGO (Based on Group 3)—

Range oil	.03⅞	.04
No. 1 prime white, 38-40	.03¾	.03⅞
No. 2 straw, 32-36	.03½	.03¾
No. 3 zero to 15, 28-32	.03½	.03⅝

NEW YORK (Bayonne, N. J.)—

*No. 1	.053	.055
*No. 2	.045	.047
*No. 4	.045	.047

*Barge deliveries ⅛ to ¼ cent under above tank-car price.

Gas Oil and Fuel Oil

(Gas oil per gal., fuel oil per bbl.)

OKLAHOMA (Group 3)—

U.G.I. gas oil, under 35	.03½	.03¼
No. 5, low pour point, 18-22	.72½	.77½
No. 6, 15 and above, 8-14	.50	.55

NORTH TEXAS—

U.G.I. gas oil, under 35	.02¾	.02⅞
No. 5 low pour point, 18-22	.72½	.77½
No. 6, 15 and above, 8-14	.50	.55

NORTH LOUISIANA (Ark. and N. La. delivery)—

10-14 fuel oil, industrial		.70

CHICAGO (Based on Group 3)—

U.G.I. gas oil	.02¾	.03
No. 5, low pour point, 18-22	.75	.80
No. 5, 15 and above, 18-22	.60	.70
No. 6, low pour point, 10-16	.60	.70
No. 6, 15 and above, 10-16	.55	.60

PENNSYLVANIA (inland refineries)—

36-40	.04½	.05

CALIFORNIA—

Los Angeles:		
30-40 gas oil, per bbl.	1.10	1.25
24 plus diesel, per bbl.	1.10	1.25
24 plus diesel (bunkers)	1.20	1.35
12-16 (bunkers at tidewater)	.65	.75
10-16 (cargo lots)	.65	.75
12-17 (tank cars)	.60	.75
10-17 (high sulfur)	.50	.65
San Joaquin Valley:		
10-18 (tank cars)	.55	.70
24 plus diesel, per bbl.	1.10	1.25
San Francisco:		
24 plus diesel, per bbl.	1.35	1.40
24 plus diesel (bunkers)	1.40	1.50
10-16 (bunkers)	.75	.80

GULF COAST—

No. 2 fuel	.03¼	.03½
43-47 diesel	.03¼	.03½
48-52 diesel	.03½	.03⅝
53-57 diesel	.03⅝	.03⅞
58-and-above diesel	.03⅞	.04
Diesel bunkers		1.50
Bunker C (bulk cargoes)		.80
Bunker C (bunkers)		.80

NEW YORK (Bayonne, N. J.)—

27 plus, gas oil		.048
28-30 diesel (lighterage 6¼c per bbl.)		1.95
28-30 diesel (tank cars)		.047
Bunker C (to ocean-going ships in N. Y. Harbor	1.15	1.25
Industrial fuel (tank cars)		.046

Lighterage charge 5c bbl. additional.

Bright and Steam Refined

OKLAHOMA (Group 3)—

200-210 D, 10-25		.18
150-160 D, 0-10		.13½
150-160 D, 10-25		.13
100-110 D, 0-10		.13
100-110 D, 10-25		.12½
Steam refined:		
600 dark green (untreated)		.07

PENNSYLVANIA—

Bright Stocks (Pennsylvania Grade No. 8 color, 140-150 at 210, 545-550 flash):		
10 pour point		.14½
15 pour point		.13½
25 pour point	.12	.13
Steam refined:		
600	.07	.07½
650	.08	.08½
600 flash	.09	.09½
630 flash	.11	.12

Neutral Oil

(Vis. at 100° F. except Pennsylvania and color N.G.A.)

OKLAHOMA (Group 3)—

0-10 pour point:		
150-3		.08
180-3		.08½
200-3		.08½
250-3		.10
280-3		.10½
280-4		.10
300-3½		.11
350-3½		.11½
400-3½		.12
500-3½		.12½
600-3½		.13
100-2½ paraffin oil, 10-25		.05¼
10-25 pour point:		
200-3		.08
250-3		.09½
280-3		.10
280-4		.09½

GULF COAST—

Pale oils:		
100-3	.05½	.05¼
200-3	.07½	.07¼
300-3	.07½	.07¾
500-3½	.08¼	.08½
750-3½	.08⅝	.08¾
1,200-3½	.08¾	.08⅞
2,000-4		.09
3,000-4		.10½
Red oils:		
200-5-6	.06⅞	.07
300-5-6	.07¼	.07½
500-5-6	.08	.08¼
750	.08⅜	.08½
1,200-5-6	.08½	.08⅝

CALIFORNIA (moving to dom. market)

Pale oils:		
100-2½-3	.07¼	.08
200-2½-3	.07¼	.08
300-2½-3	.07¼	.08
400-3-4	.07½	.08
450-3-4	.07¼	.08
550-3-4	.09	.11
600-3-4	.09	.11
Red oils:		
200-4-5	.07¼	.08
300-5-6	.07¼	.08
350-5-6	.09¼	.11½
400-5-6	.09¼	.11½
450-5-6	.09¼	.11½
500-5-6	.09¼	.11½
600-5-6½	.09¼	.11¾
700-6½ plus	.09¼	.11½
750-6½ plus	.09¼	.11¼
900-6½ plus	.09¼	.11¾

PENNSYLVANIA—

150 vis., at 70° F., 3 color, 400-405 flash:		
Zero pour point		.22½
10 pour point		.21½
15 pour point		.20¼
25 pour point		.19
200 vis., at 70° F., 3 color:		
Zero pour point		.24½
10 pour point		.23½
15 pour point		.22½
25 pour point		.21

Wax and Petrolatum

(Prices per pound)

OKLAHOMA (Group 3)—

124-126 (A.m.p.) w.c. scale	.02½	.03

PENNSYLVANIA (inland refineries)—

122-124 (A.m.p.) w.c. scale	.02⅞	.03
124-126 (A.m.p.) w.c. scale	.02⅞	.03

NEW YORK—

Wax in bags fully refined:		
125-127 (A.m.p.) wax		.0560
128-130 (A.m.p.) wax	.0560	.0570
130-132 (A.m.p.) wax		.0585
133-135 (A.m.p.) wax		.0615
135-137 (A.m.p.) wax		.0640
Crude scale:		
124-126 (A.m.p.) w.s.	.02⅞	.03
124-126 (A.m.p.) y.s.	.02⅞	.03
Petrolatum in barrels, carload lots:		
Dark green	.02125	.02625
Amber	.02375	.02875
Extra amber	.02625	.03000
Lily white	.04375	.05125
Snow white	.05125	.06000
Cream	.03375	.04125

Export Prices

GASOLINE

GULF COAST—

U. S. Motor		.03⅝
60-62 400		.03⅝
61-63 390	.03⅞	.04
64-66 375	.03⅞	.04

LOS ANGELES—

U. S. Motor grades:		
Above 69 octane	.05½	.05⅝
65-69 octane	.05¼	.05⅜
60-65 octane	.04½	.05

KEROSENE

GULF COAST—

41-43 water white	.03¾	.04

LOS ANGELES—

41-43 water white	.05	.05¼

LUBRICANTS

(Pennsylvania Grade)

NEW YORK (f.a.s. in bbl.)—

Cylinder stocks:		
600 S.R. unfiltered		.16
630 S.R. unfiltered		.17
600 flash, S.R.		.18
650 flash, S.R.		.20
Bright stock:		
Light, 25 pour point		.20⅜

NEUTRAL OIL

200-3 color		.27
150-3 color		.25⅜

PARAFFIN WAX

NEW YORK (prices per lb.)—

123-125 A.m.p.		.05600
125-127 A.m.p.		.05600
128-130 A.m.p.		.05850
133-135 A.m.p.		.06150
135-137 A.m.p.		.06400
Crude scale:		
124-126 w.s.	.02⅞	.03
124-126 y.s.	.02⅞	.03

Applying Subsurface-Pressure Measurements in East Texas

(Continued from Page 85)

checking the pressure inside the tubing against casing pressure opposite the valve that failed to reopen. (See Fig. 12.) The distance the fluid level unloaded below the valve was found to be the differential opening pressure of the valve divided by the gradient inside the tubing.

2. The valve that had failed to open due to the weakening of the valve spring was also found by the above method when the valve did not open at its original differential. (See Fig. 12.)

3. The point or points of gas injection by a valve, port or a leak in the tubing was found by the change in slope of the flowing traverse. (See Fig. 13.)

4. The submergence pressure at the valve was found with the flowing gradient. (See Fig. 13.)

5. The differential pressure across the valves was found by subtracting the pressure inside the tubing from pressure in the annular space at the valve. (See Fig. 13.)

6. The weight of the aerated fluid was determined by the flowing gradient. (See Fig. 13.)

7. The water-and-oil contact was determined by the change in slope of the shut-in traverse. (See Fig. 13.)

Bottom-hole pressures have been used in gas lift for other purposes, and in conjunction with other devices, however, this paper does not attempt to discuss all of them.

Fig. 14 is the plotted gradient of a well that failed to flow because the valves were too far apart. The 100-lb. differential opening valves are spaced 400 ft. apart and the valve will only unload the annular space 320 ft. This leaves the next valve submerged 60 ft. under fluid. The valves would unload the 400 ft. of fluid with 130-lb. differential valves.

The same figure illustrates the type of data that would indicate a weakened valve spring if the valves had been 130-lb. differential opening when they were installed.

Fig. 13 is a plotted shut-in and flowing traverse that indicates the oil-water contact, the point of gas injection and the submergence of the valve or port that is injecting gas. The water-oil contact is indicated at 3,120 ft. by the change in slope of the shut-in traverse, and the gradient below this point indicates water. The point of gas injection is indicated at 1,600 ft. by the change in slope of the flowing traverse and the gradient above this point shows highly aerated fluid. The submergence at the point of injection is 267 lb., the reading of the bomb at that point.

The differential across the valves is 115 and 78 lb., respectively. This was found by reading the pressure in the annular space from the curve and subtracting the pressure inside the tubing at the valves.

Cleanout and Workover Operations

The use of subsurface pressure data has removed considerable of the guesswork in some types of workover jobs. If the productivity factor of a well indicates good permeability and at a later date the productivity factor is considerably less, it indicates a plugging of part of the sand or liner; provided, of course, the well has not been "plugged back" to shut off water and the ratio of water, oil, and gas has not greatly changed. If there is no liner in the hole the sand is partially plugged. This may be caused from cavings, paraffin, etc. The operator can definitely tell whether the well needs a cleanout job, or if only a change in lifting equipment is necessary. Often times a bottom-hole-pressure test will indicate that the productivity factor has not changed and that only a change in pumping or gas-lift equipment is necessary, thus saving an expensive cleanout job. If, in completing a new well in an area of good permeability, satisfactory production is not obtained, there is usually good reason to believe that excessive filtration, improper perforating or some such condition is retarding the flow of oil into the well bore. We completed a well several years ago with cable tools and the well failed to produce satisfactorily although it was in an area of good flowing wells. Productivity factors were obtained on this well and on all offset wells. This data clearly indicated the oil was not coming into the new well at the rate of the offsets. The well was drilled a few feet deeper and subsequent production and bottom-hole-pressure tests showed it to be comparable to the offset wells.

The use of subsurface-pressure data for workover and cleanout operations becomes increasingly important as the field grows older. The question will often arise as to whether production decline is due to the natural decline in formation pressure or whether to plugging of liners, casing perforations or sand face. By a few bottom-hole-pressure measurements considerable guesswork can be eliminated, thus saving many dollars spent on useless workover jobs.

The use of subsurface-pressure correlations in conjunction with drill-stem tests is an application which has only been in use the last few years. While this application will be of little use now in the East Texas field, it will have considerable application in wildcat or semiwildcat wells of this section in the future. . . .

Besides being of assistance in ordinary drill-stem tests of open formation, the pressure records are valuable in tests of perforation jobs, water-shutoff jobs and in testing casing seats. The subsurface-pressure measurements ordinarily are obtained by placing a subsurface recording gage in a lower extension of the perforated section of a drill-stem testing tool.

The importance of using a subsurface-pressure gage in drill-stem testing cannot be stressed too much as this is the only means of definitely determining, under certain conditions, whether the tester has actually operated as it should.

Fig. 15 was plotted from information shown by chart in Fig. 14. Fig. 15 shows the tool to have opened satisfactorily and test was O.K.

Fig. 16 definitely shows the tool did not open since there was no abrupt drop in pressure. The pressure would have dropped had the tool actually opened when manipulated at the surface. No fluids were recovered on this test and had the pressure record not been obtained, the formation would have been assumed to be dry.

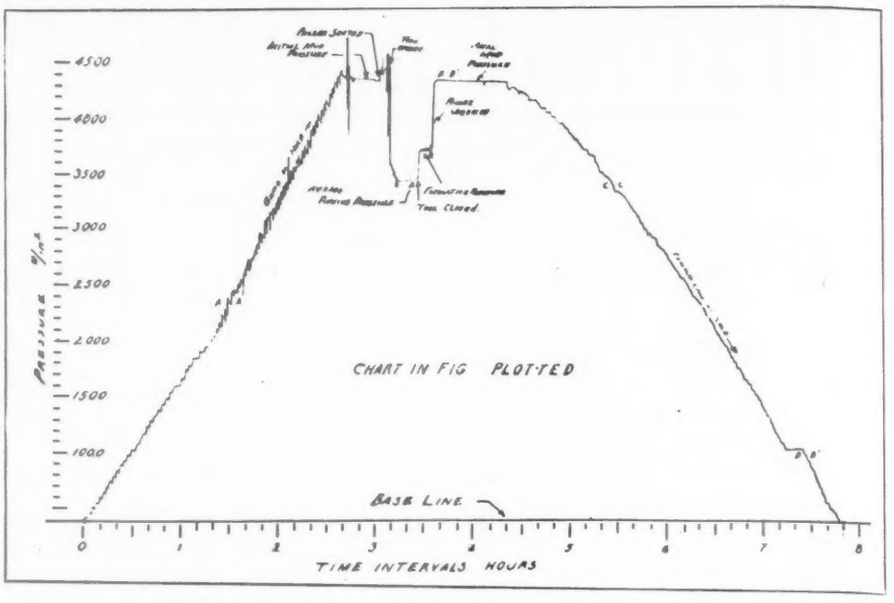


Fig. 15

Acknowledgments

I wish to express my appreciation to Bert Crowder and W. S. Morris for their aid in obtaining curves, pictures, and other data; also to Curtis Maxwell for his most valuable assistance. I also wish to thank Humble Oil & Refining Co. for granting permission to present this paper.

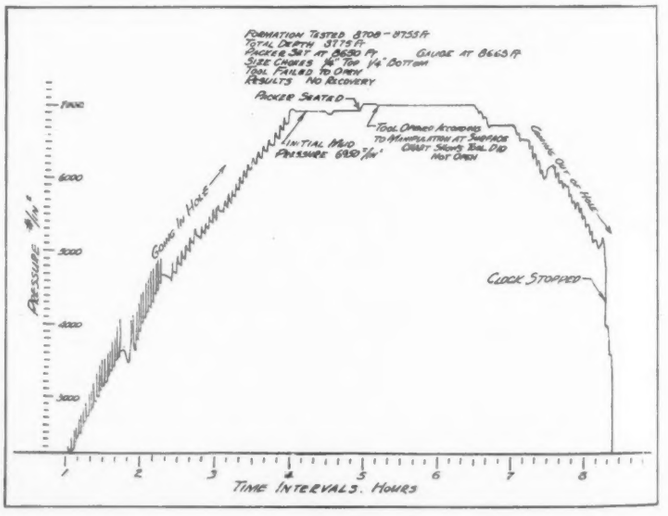
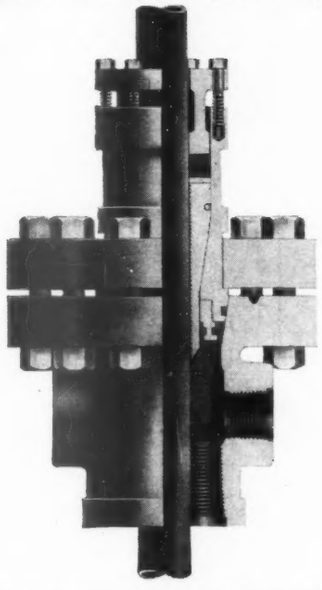

FORMATION TESTED 8708 - 8755 Ft.
TOTAL DEPTH 8775 Ft.
PACKER SET AT 8650 Ft.
SIZE CHOKES 16" TOP 1/4" BOTTOM
TOOL FAILED TO OPEN
RESULTS NO RECOVERY
GAUGE AT 8665 Ft.
PACKER SEATED
INITIAL MUD PRESSURE 6850 #/in²
TOOL OPENED ACCORDING TO MANIPULATION AT SURFACE CHART SHOWS BALL DID NOT OPEN
GAUGE OUT OF HOLE
GOING IN HOLE
CLOCK STOPPED
PRESSURE #/in²
TIME INTERVALS. HOURS

Fig. 16

EQUIPMENT PROGRESS...

New-Type Tubing Head Features Easily Replaced Stripper

The McEvoy Co., Houston, Tex., has announced a new stripper-type tubing head with slip suspension of tubing. A stripper rubber of new design, giving exceptional thickness at the point of greatest wear, is said



to result in increased stripper life. When the stripper becomes worn it is renewed simply by screwing a new low-cost rubber into the tubing hanger.

Slips located just above the stripper permit movement of tubing to actuate production packers and allow final suspension of tubing at any desired point. Adjustable, confined Neoprene packing above the slips may be changed under pressure without disturbing slips or tubing. Any of the McEvoy Series L tubing hangers fit interchangeably in this body, thus permitting the substitution of lower-cost hangers when strippers are no longer necessary.

J. O. Lashar's Letter Leads to Design of "Uncle Sam Button"

In the October 14, 1940, issue of Newsweek a letter written by Jay O. Lashar, director of advertising for American Chain & Cable Tool Co., New York, was published in which he urged the adoption of an "Uncle Sam Button." Following publication of this letter many expressions of interest were received from individuals, publishers, chambers of commerce and American Red Cross chapters. As a result the Parisian Novelty Co., Chicago, has been granted sole license to manufacture the buttons with all royalties to be donated to the American Red Cross.

The buttons illustrate Uncle Sam with the wording "I am PROUD he is MY Uncle." Prices for the buttons are quoted as follow: 1,000, $27.50; 2,500, $56.50; 5,000, $99.50; 10,000, $167; 25,000, $380; 50,000, $690; 100,000, $1,265; and 250,000 buttons, $2,825. These buttons make a splendid good-will give-away item for use by any individual, company or organization. Orders for buttons should be sent direct to the Parisian Novelty Co., Chicago.

BUSINESS NOTES

On an eastern business trip Walter G. L. Smith, general manager of E. M. Smith Co., of Los Angeles, Calif., manufacturer of Grizzly high-quality oil-field products, has just concluded a few days spent in the Houston, Tex., district. His important conferences, scheduled with leading oil-company executives in the major fields throughout the Mid-Continent and Gulf Coast, will possibly include discussions on the latest E. M. Smith Co. announcement of a new method of installation for Grizzly "Hug-Tite" drill-pipe protectors and stabilizers.

The Bruce-Macbeth Engine Co., Cleveland, Ohio, has announced the appointment of Max E. Landry of Tulsa as sales representative. Mr. Landry will cover Oklahoma, the northwestern part of Arkansas, and the southern part of Kansas.

Complete All-Wheel-Drive Line Offered by Marmon-Herrington

There is a 1941 Marmon-Herrington all-wheel-drive truck that exactly meets any hauling requirement, according to an official of the company. This applies whether the particular job calls for a ½-ton pickup truck, a 35-ton 6-wheeler, or anything between. The line starts with a series of extra heavy-duty models, with power and traction on all four or all six wheels, in capacities up to 70,000 lb. It also consists of conversion of all standard Ford trucks, commercial cars and passenger cars to all-wheel-drive. Over 40 different models altogether are available.

Conversion of standard Fords to all-wheel-drive by Marmon-Herrington is in no sense an "accessory" job. The work requires trained factory personnel, and specialized equipment and when completed, results in an all-wheel-drive vehicle with all the advantages and dependability that could be attained through building from the ground up in the Marmon-Herrington plant. At the same time, the owner has all the worldwide servicing facilities of the vast Ford organization at his command.

D. A. Robison and G. E. Spain Advanced by Caterpillar

Caterpillar Tractor Co. has announced two important advancements in the company's organization. Donald A Robison has been made a vice president of the company with administrative direction of all selling and advertising activities. The office of general sales manager, which Mr. Robison leaves to assume his higher duties and responsibilities is being filled by the advancement of Gail E. Spain.

Mr. Robison, a native of Nevada, has been closely associated with Caterpillar Tractor Co. activities for many years. He was graduated from the University of Nevada with a business degree, and almost immediately went to work for the company. Since 1926 he has advanced rapidly through the various activities in the credit and treasury department, to the office of assistant treasurer, treasurer, and general sales manager.

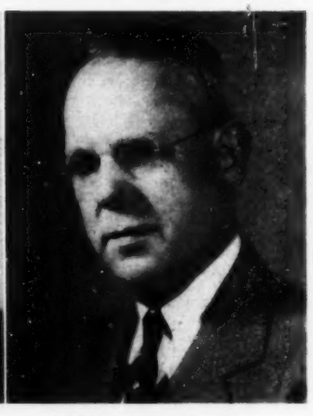
Mr. Spain, who came from Portland, Ore., and received the degree of mechanical engineer at Oregon State College, is widely known throughout the construction and agricultural-equipment industries. In 1920 he went to work for the Willamette Iron & Steel Works at Portland, and during his 9 years with that concern advanced through the engineering and sales departments. For 2 years before coming to Caterpillar, Mr. Spain was Willamette's sales manager.

In 1929, he joined the Caterpillar organization at San Leandro, Calif., being transferred to Peoria, Ill., in the summer of that same year. First a logging representative for the company, Mr. Spain later held positions in the merchandise, engine sales, and general sales departments. Since 1938 he has been manager of the sales development division.

LEON PAYNE APPOINTED TREASURER OF CARNEGIE-ILLINOIS STEEL

LEON F. PAYNE

A. C. WIMMER



FRANK L. WIEGAND

Leon F. Payne, treasurer of Oil Well Supply Co. since 1929, has been appointed treasurer of Carnegie-Illinois Steel Corp. He will make his headquarters in Pittsburgh, Pa., moving there from Dallas, Tex., where "Oilwell" has maintained its general offices since 1932. Following graduation from Brown University, of which he is now an alumni trustee, Mr. Payne began his business career in 1907 with Western Electric Co. In 1909 he became associated with the sales department of Carnegie Steel Co., was made head of the credit department in 1918 and continued in that capacity until he joined "Oilwell" in 1929. He is widely known in the steel and the oil-field equipment industries and in banking circles.

A. C. Wimmer succeeds Mr. Payne as treasurer of Oil Well Supply Co. Mr. Wimmer joined the "Oilwell" organization in 1916, and his association with the company has been interrupted only by his active service with the A.E.F. in the first World War. In 1932 he was made credit manager of the company's Midwest division and later was appointed assistant treasurer.

Frank L. Wiegand has been appointed assistant treasurer. He has been connected with "Oilwell" since 1898 and has held several positions of responsibility. Both Mr. Wimmer and Mr. Wiegand are widely acquainted throughout the oil fields. They will continue to make their headquarters at Dallas.

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WHY drill dry holes? Our method only locates structures which contain oil or gas. Drawer 711, Brownsville, Texas.

CRANE CO., oil possibilities, cheap fee land, 3 mi. E Ward Gulf-Western drilling. J. G. SMITH, 215 Littlefield Building, Austin, Texas.

$4500 BUYS 7 oil and 4 gas wells; 15 to 20 direct offset locations; powers; Ideal for water flooding; 2 intake wells already drilled. H. W. MITCHELL, Osawatomie, Kansas.

FOR SALE—10 acres Johnston Co. Okla. NW ¼ of NW ¼ of SE ¼, Sec. 19, Twp. 2S, Range 8 East. $100.00 Barry, 3505 Legation St. NW. Washington, D. C.

HOMER L. FITCH, GEOPHYSICIST AND LOCATION ENGINEER
WHY drill dry holes? Our method only locates structures which contain oil or gas. Drawer 711, Brownsville, Texas.

WILL take $7500.00 cash for ½ interest in 3000 acres oil leases and drilling well, half completed, good geology, on West Texas Structure, six formations to 3250 ft. depth. Address Owner, 610 Wilson Building, Dallas, Texas.

Leases and Drilling Blocks

SPECIALIZED Geophysical investigations conducted for petroleum promise. In touch with many opportunities to and for development of drilling blocks. P. O. Box 364, Fort Worth, Texas.

NEW MEXICO State oil leases bought and sold, also farms and ranches. Send for list. WM. C. UPHOFF, Box 1108, Santa Fe, New Mexico.

RESPONSIBLE Company wants to buy E. Texas producing properties. Give full details and price. Address Box A-264, The Oil and Gas Journal, Tulsa, Okla.

ILLINOIS Basin. Oil leases in several Counties. Must sell. Would contract some. Would trade some for Spudder. ELTON BECK, Herrick, Illinois.

100 ACRES, sale or lease, Liberty Co. Texas, by owner. Mr. Juelfs, 28 W. Ashley St., Jacksonville, Fla.

FOR LEASE: Several hundred acres off setting Algoa Producer, Bolivar Peninsula. Write Mrs. H. M. Harrington, 1726 O½ Avenue, Galveston, Texas.

Business Opportunities

ATTENTION INVENTORS
Will finance and manufacture proven equipment, small or large that will be salable to the oil industry.
BOX A-260
The Oil and Gas Journal,
Tulsa, Oklahoma.

NEED SALES REPRESENTATION? Can handle few more outstanding oil-field trade items. Fine clientele. Box A-282, The Oil and Gas Journal, 617 Petroleum Bldg., Fort Worth, Texas.

WANT to contact one Pennsylvania, one Mid-Continent, one Gulf Coast refiner of lubricating oils willing to share in maintaining a Chicago sales office under the management of a young man who has had 12 years of oil jobbing experience and knows industrial as well as automotive oils. Box A-280, The Oil and Gas Journal, Tulsa, Okla.

SOMETHING NEW
Building fireproof filling stations, warehouses, low cost homes and tourist camps. Year round income. Just pour concrete in steel forms. Inexperienced labor can build at warehouse. Manufacturers rights now available for Oklahoma, Texas, Kansas, Arkansas, Pennsylvania, New Mexico, Illinois and California. Address: Peter J. Minck, 410 North Meridian Street, Indianapolis, Indiana.

Royalties

ANDREW J. BARRETT
The Philtower
Tulsa, Oklahoma

Brokers—Salesmen

Sell in the most active area in the United States—The Permian Basin of West Texas and Southeastern New Mexico. From the standpoint of royalty investors this area has much to offer. Can supply you with choice non-producing royalties located on geophysical highs. Also drilling blocks, close in acreage to production, or wildcat leases. I maintain my own field men who cover this area for me. All offerings meet the requirements of the Security and Exchange Commission. Iquiries invited.

B. D. BUCKLEY
Paul Brown Bldg., St. Louis, Mo.

WILL purchase royalties, or a part thereof, on land in Illinois. Must first be given right to test land with my method, which quickly eliminates non-mineral formation. This test is done without charge and free from any obligation on part of owner of land. Not interested in brokers offers. Address Box A-268, The Oil and Gas Journal, Room 1404, 105 W. Madison, Chicago, Illinois.

For Sale—Maps

1940 OIL AND GAS FIELD MAP
Texas, Eastern New Mex. Price $1.00.
Wildcat Map $3.00 Published monthly
ZINGERY OIL MAP CO., Fort Worth, Tex.

Geophysical Service

ATTENTION. Why not locate Oil? A dry structure is not profitable. Unless we locate the Oil and Gas for you you pay us nothing for the survey. Maps and written reports furnished free. A Direct Geophysical Method that you can understand. Write Gravitational Selector, 14957 Lakewood Heights Boulevard, Lakewood, Ohio.

Situations Wanted

PETROLEUM Geologist with ten years' experience in surface and subsurface work in Mid-Continent, Gulf Coast and Rocky Mountain areas, desires connection with a reliable oil company.
Box A-267
The Oil and Gas Journal, Tulsa, Okla.

AVAILABLE Chemical Engineer with thirty-five years of technical, administrative and executive experience, mostly in the Petroleum Industry. Box A-263, The Oil and Gas Journal, Tulsa, Oklahoma.

SECRETARY—26, 5 years' experience, desires change. Go anywhere, prefer Houston vicinity. Box A-272, The Oil and Gas Journal, Tulsa, Okla.

I MAY BE JUST THE MAN
You are looking for—If you need a salesman or contact man for the oil industry. 8 years representing one firm calling on producers, drilling contractors and prod. supts., principally in Texas and La. To those interested in contacting this group personally I offer an excellent background of experience (not technical). References of the best. Box A-281, The Oil and Gas Journal, Tulsa, Okla.

CORRESPONDENT, oil mining, sales, promotional. Own typist, 20 yrs. exp. Office, statistical. 1625 W. 20th, Okla. City.

SUPERINTENDENT with 15 years experience with one company in production, drilling, land leasing, casinghead gas manufacture. Studied geology at University of Oklahoma. Desires connection with progressive oil company. Box A-283, The Oil and Gas Journal, Tulsa, Okla.

Help Wanted

WANTED immediately, Machinist, refinery experience, capable and reliable, steady work, 90c hour, 40 hour week; give references in letter. Box 1011, Mt. Pleasant, Texas.

Incorporations

DELAWARE CHARTERS: Complete service $35. Submitted forms. Chas. G. Guyer, Inc., Wilmington, Delaware.

CAPITAL SEEKERS
Put your project before 260 Key-Men. Cost trifling. Details free. AMSTER LEONARD, Fox Theater Building, Detroit, Michigan.

Survey Service

REMEMBER EAST TEXAS
"When all other methods fail, employ my divining or dowsing method. If oil exists this method finds it. Faults, broken treacherous areas accurately defined. Our Watson #2 first producer Wilmington, Calif., field, located by this method. Not theoretical prognostications. Approximate depths and thickness of sands given. I own production. Information to prospective operators, only. George Miller, 1548 Post, Torrance, California."

Oil Industry Printing

OIL FIELD LEGAL BLANKS
Leases, assignments, releases, township plat books, well records, etc. Request on your letterhead gets free catalog. Olds Press, 215 East Third St., Tulsa, Okla.

Wanted

TANKERS
DRY DOCK; wood, 10,000-ton D.W.T.
DREDGE: hydraulic, for approx. 18" to 24" section line.
TUGS & BARGES; ocean.
IRON & STEEL PRODUCTS, INC.
13412 S. Brainard Ave., Chicago, Illinois
'Anything containing IRON or STEEL'

Addresses Wanted

SUITABLE REWARD will be paid for location of R. J. Stone, oil promoter, and 1940 Buick Sedan and Glenn A. Jordan and 1939 Plymouth Coupe. Notify Automobile Claim Service, Tulsa, Okla. Western Union or phone 2-5959.

For Sale

MAN'S new bearskin overcoat. Cost $350.00. Would make into wonderful rug for den. Sell at discount or trade for gasoline books. 426 No. Santa Fe, Tulsa, Okla.

CLASSIFIED ADVERTISING RATES

Classified advertising rates: First insertion, 35 cents a line; each additional insertion, 25 cents a line, PAYABLE IN ADVANCE. Six words usually make a line. Count as a word each one-letter word and each group of figures. White-space computed at regular line rate. Allow two extra lines for blind ads. Ads of less than three lines not accepted. No formal acknowledgment is made, and proofs cannot be shown in advance of publication.

	1 time	2 times	3 times	4 times		1 time	2 times	3 times	4 times
3 Lines	*$1.05*	*$1.80*	*$2.55*	*$3.30*	*7 Lines*	*$2.45*	*$4.20*	*$5.95*	*$7.70*
4 Lines	*1.40*	*2.40*	*3.40*	*4.40*	*8 Lines*	*2.80*	*4.80*	*6.80*	*8.80*
5 Lines	*1.75*	*3.00*	*4.25*	*5.50*	*9 Lines*	*3.15*	*5.40*	*7.65*	*9.90*
6 Lines	*2.10*	*3.60*	*5.10*	*6.60*	*10 Lines*	*3.50*	*6.00*	*8.50*	*11.00*

CLASSIFIED DISPLAY RATES

Classified Display is set with a border and may be used in one or two column sizes.

1 Inch	*1 time*	*$5.00*
1 Inch	*13 times*	*4.50 per inch*
1 Inch	*26 times*	*4.00 per inch*
1 Inch	*52 times*	*3.50 per inch*

This space may be contracted for over a period of one year from the date of the first insertion and is PAYABLE IN ADVANCE, MONTHLY.

We reserve the right to withhold all advertising of questionable character. To avoid delay be sure to send remittance with copy. We will set your ad in the smallest amount of space possible and refund all overpayments. One-time insertions will not be run until fully paid. Forms close MONDAY NOON before each issue date.

THE OIL AND GAS JOURNAL
Tulsa, Oklahoma

Financing

DEVELOPMENT loan or advance negotiated on commission basis for a matter of exceptional merit. Box 5411, Philadelphia.

NEED one high type man to finance drilling. Famous high gravity shallow area . . . absolutely PROVEN. Good for $30,000 yearly or better. Must finance self two or three weeks. Shallowell Drilling Co., Box 448, Cisco, Texas.

WANTED—Oil loans $250,000 to $5,000,000. Low rates, long terms. L. A. (Pat) Casey, 511 Lexington Ave., New York; Esperson Bldg., Houston.

Legal Blanks

BURKHART'S legal blanks and general forms serving Mid-Cont. oil field since 1906—Okla. Kans. N. Mex. Tex. Ala. Ark. Fla. Ga. Ill. Ind. Ky. La. Mich. Miss. Mo. Neb. N. Dak. Tenn. Wyo. Free catalog samples on request. Burkhart Ptg. & Sta. Co., 115 S. Cinn., Tulsa, Oklahoma.

Mailing Lists

ROYALTY owners, Oil Investors, Unit Holders, Stockholders in Oil and Royalty Companies. Personnel lists of every branch of oil industry. All by States. We buy lists. New catalogues ready. Oil Industry Mailing List Co., Tulsa Loan Bldg., Tulsa, Oklahoma.

Equipment Wanted

WANTED—USED TANK CARS

Interested in purchase of one or more not older than 1927-built class #4 tank cars with 50-ton trucks. Communicate Box A-265, The Oil and Gas Journal, Tulsa, Okla.

For Sale—Equipment

FOR SALE

One gasoline drilling rig with two 85 H.P. Waukesha motors and unitized draw works complete.

300 sets 3" A.P.I. tool joints.

10,000 Ft. 7" O.D. 26# seamless casing, once run.

15,000 Ft. 4½" O.D. seamless drill pipe equipped with both regular and full hole tool joints.

In addition to the above we have 20,000 Ft. of 6" screw line pipe in Oklahoma; also drilling rig capable of drilling to 6500 feet, complete stock of line pipe, casing, drilling and pumping equipment.

Wire, Write or Phone for Prices

Louisiana Iron & Supply Co.
Shreveport, La.

FOR SALE—USED BOILERS
1 90HP-225SWP Acme Oklahoma City
LUCEY PRODUCTS CORPORATION
TULSA

FOR SALE: At our Oklahoma City warehouse slightly used Cardwell KS DHS skid type oil well servicing unit equipped with DHK Waukesha motor. I. T. I. O. Co., Bartlesville, Okla.

25 K.W. and 40 K.W. Gas Engines, 220 volts, D.C. Two 100 K.W. Gas Engine-Generator Sets, 220 volts, D.C. 7x6 Ingersoll-Rand ER-1 Air Compressor. Six-inch Peter Pipe Threading Machine. Also large stock of lathes, pipe machines, milling machines, etc. Send for our list.
Terms to suit.
CINCINNATI MACHINERY & SUPPLY CO.
26 West 2nd St., Cincinnati, Ohio

FOR SALE

30-TON S/G LIMA GASOLINE, 0-4-0 SWG. LOCO. NEW 1931, GOOD COND. ROLLER BEARING. Immed. Delivery. SEND US YOUR INQUIRIES FOR ANY KIND OF LOCOMOTIVES

IRON & STEEL PRODUCTS, INC.
13412 S. Brainard Ave.
Chicago, Ill.
"Anything containing IRON or STEEL"

FOR SALE: 1—No. 28 Star steam drilling machine 60' mast serial C 507, less tools, located near Wynona, cheap. I. T. I. O Co., Bartlesville, Okla.

INTEGRATOR — EMCO-McGAUGHY MAKE—IN GOOD CONDITION, ATTRACTIVE PRICE. U. & I. SUPPLY CO., JACKSON, MICH.

FOR SALE: 1—Ideco Portable Standard Rig suitable for drilling, pumping, or servicing, complete less motor. I.T.I.O., Bartlesville, Okla.

For Sale—Equipment

For Sale—Equipment

For Sale—Equipment

Season's Greetings

SONKEN-GALAMBA SUPPLY COMPANY

W. C. Berry—H. J. Galamba
Riverview at Secod St., Kansas City, Kansas

Robt. W. Duden
2100 South Union St., Tulsa, Oklahoma

FOR SALE OR LEASE
Any part of 50 tank cars. Pennsylvania Oil Products Refg. Co., Warren, Pa.

TRACTORS
Caterpillars, crawler type, size "35," $375; size "65" with nigger-head winch, $750; Caterpillar RDS with bulldozer, $2000; Allis-Chalmers Model L with bulldozer $1750. Guaranteed, slightly used. O. C. Evans, Mt. Sterling, Ky.

FOR SALE

ANY QUANTITY
NEW SEAMLESS STEEL COUPLINGS

300—4", 8 thread x 4⅝" long, Line at 55c each.
1000—13" O.D. (12⅛" Pipe) 8-V Thread x 8¼" long, Line at $1.65 each.
5000—1¼" Black Merchant Forged Steel, at 4c each.
5000—1½" Black Merchant Forged Steel, at 5½c each.

RECONDITIONED PIPE

30,000 feet 12", 50 lb. at $1.25 per foot.
100,000 feet 6" Std. at 38c per foot.
All of the above F.O.B. Philadelphia District, subject to prior sale. Pipe in lengths 18'0" and longer, plain ends.

EASTERN PIPE SUPPLY COMPANY
1424 N. NINTH STREET
PHILADELPHIA PENNA.

FOR SALE: 4 — OCS Roller Bearing Chain Driven Sand Reels. I. T. I. O., Bartlesville, Okla.

FOR SALE OR MAY LEASE
COMPLETE
STANDARD DRILLING OUTFIT
ALL equipment is the latest type and is in first class condition. New 125 Diesel Caterpillar. This outfit is complete with fishing tools. Inquire Box 112, Jerome Hotel, St. Joseph, Mo.

FOR SALE, liquid purification plant, capacity 6,000,000 cubic feet of gas per day, also 4 steel purifier boxes, capacity 6,000,000 cubic feet per day. All in excellent condition. Operation ceased November 1, 1940.
Box A-270
The Oil and Gas Journal, Tulsa, Okla.

RECEIVER'S SALE
5 fully equipped producing gas wells, 6 producing oil wells, 3 equipped non-producing oil and gas wells. National Drilling Machine, tools and miscellaneous equipment. Leasehold rights on 174 acres. Room for Additional Development.
SALE — WEDNESDAY—JANUARY 15, 1941—1:00 P.M. on Premises 5 miles South of St. Clairsville, Ohio. For details write Carter Thornburg, Receiver, The Richland Developing Association, St. Clairsville, O.

FOR SALE: At Bartlesville, Oklahoma, 1—50 HP Kewanee locomotive type boiler with stack 150# WP. Will pass state inspection. $200.00. I. T. I. O., Bartlesville, Okla.

TRANSIT and LEVEL REPAIRING
Fully equipped modern shop—all makes repaired
Low cost—service unsurpassed—all work guaranteed
Send for list of reconditioned instruments
We pay cash for used instruments
NATIONAL BLUE PRINT CO.
308 Union Station Bldg. Est. 1914 CHICAGO, ILL.
Chicago Sales Representatives—W. & L. E. Gurley

FOR SALE: At Bartlesville 1—2A National Portable Drilling Machine Less Tools. I. T. I. O. Co., Bartlesville, Okla.

SMALL complete rotary. Longyear rotocore hoist. Derrick on truck. 7¼ x 10 G D pump. Two gas engines. Ready to drill less drill pipe. 109 N. Waggoner, Electra, Texas.

FOR SALE: In Oklahoma City field 50—1000 barrel BS&B VP used oil storage tanks, Cheap. I. T. I. O., Bartlesville, Oklahoma.

NOTICE — CABLE-TOOL CONTRACTORS. Save money; good used wire lines. All sizes up to 5,000 ft. long. See us before you buy. General Tool & Supply Co., P.O. Box 4387, Oklahoma City, Oklahoma.

One 7' x 12' two-door steel tool house. One 4-in-line roller bearing crown block with 36" manganese steel sheaves on 20" beams. A-1 shape. 1300 Ramsey Tower, Oklahoma City, Oklahoma.

FOR SALE: At Oklahoma City 2—set slightly used 6½" Spang Weldless drilling jars 4½" stroke 3¼"—4¼" box and pin, $100.00 per set. I. T. I. O., Bartlesville, Okla.

FROM REFINERY equipment we offer 1—ten thousand barrel riveted tank, 2—Scotch Marine Boilers, 2—6' x 40' Bubble Towers, 1—5' x 51' Bubble Tower, 2—5' x 40' Flash Towers, 300—4" Still Header Boxes, 1—6' x 96' Smoke Stack, 2—18 x5 x 18 Pumps, 1—10 x 6 x 24 Worthington Simplex Hot Oil Pump, 1—22 x 36⅝ x 6 x 24 Wilson Snyder Duplex Hot Oil Pump, 3—85 HP Diesel Engines, 1—Cracking Furnace, brick, castings, and structure, 1—Exhaust Steam Heater.
Box 1011 — Mt. Pleasant, Texas.

TWO WELL SERVICING UNITS, one 30 and one 60 model Caterpillar tractors with Cardwell and Hopper winches respectively. A-1 condition, priced reasonably with terms. Paul Rutledge, 424 N. Cincinnati, Tulsa, Okla.

CRUDE-OIL PRICES IN REPRESENTATIVE FIELDS

Complete crude-price schedules are now being published in the first issue of each month. The last complete schedule was published in the December 5 issue. **All changes in crude-oil-price schedules will be published completely in the first issues following the announcement of the changes. Following are representative crude-price schedules in barrels (42 gal.):**

East Texas	**$1.10**
Conroe	**1.27**
Tepetate, Louisiana	**1.03**
Smackover, Arkansas, heavy	**.73**
Illinois basin	**1.15**
Pecos County, Texas	**.78**
Lance Creek, Wyoming	**.77**
Bradford, Pennsylvania	2.15

Gravity Schedules

Top prices include all gravities above grades designated, and low prices include all gravities below grades designated:

	Hill, California* Signal	Oklahoma, Kansas	Coast, Texas Gulf
14-14.9	$0.65	....	....
15-15.9	.65	....	....
16-16.9	.65	....	....
17-17.9	.65	....	....
18-18.9	.65	....	....
19-19.9	.69	....	$0.86
20-20.9	.73	$0.70	.88
21-21.9	.78	.72	.90
22-22.9	.82	.74	.92
23-23.9	.86	.76	.94
24-24.9	.90	.78	.96
25-25.9	.95	.80	.98
26-26.9	.99	.82	1.00
27-27.9	1.03	.84	1.02
28-28.9	1.07	.86	1.04
29-29.9	1.10	.88	1.06
30-30.9	1.14	.90	1.08
31-31.9	....	.92	1.10
32-32.9	....	.94	1.12
33-33.9	....	.96	1.14
34-34.9	....	.98	1.16
35-35.9	....	1.00	1.18
36-36.9	....	1.02	1.20
37-37.9	....	1.04	1.22
38-38.9	....	1.06	1.24
39-39.9	....	1.08	1.26
40-40.9	....	1.10	1.28

*Effective Feb. 1, 1940.

Crude-Oil Price Changes

Another advance of 15 cents per barrel was instituted December 17 throughout the Pennsylvania-grade producing district. The advance, boosting Bradford grade crude to $2.15 per barrel, was instituted by South Penn Oil Co. and was followed by several other large purchasers. An earlier advance of 15 cents was made effective November 12. There has been an exceptionally strong domestic demand for bright stocks and neutrals in the Pennsylvania district during the past several weeks. Sinclair Refining Co. increased its Bradford grade posting to $2 per barrel, effective December 10.

Eastern States

SOUTH PENN OIL CO.
(Effective December 17, 1940)

Pennsylvania Grade oil in National Transit lines (Bradford field)	$2.15
Pennsylvania Grade oil in Southwest Pennsylvania lines	1.80
Pennsylvania Grade oil in Eureka Pipe Line lines	1.74
Corning grade oil in Buckeye Pipe Line Co. line	1.12

PENNZOIL CO.
(Effective December 17, 1940)

Group A	$2.08
Group B	2.07
Group C	2.06
Group D	2.05
Group E	2.03

QUAKER STATE OIL REFINING CORP.
(Effective December 17, 1940)

Southern Ohio (Pa. Grade):	
In Buckeye Pipe Line lines	$1.70
In Eureka Pipe Line lines	1.74

Gulf Coast Markets

(Continued from Page 89)

not overly pressing from any source.

Further increases in tanker rates and difficulty of getting boats even at the higher prices placed additional burden upon Gulf Coast refiners, particularly the nonintegrated companies, which as yet are unable to benefit from price strengthening on the East Coast.

There was some shaving of quotations on the higher diesel-index gas oils. Oil with a 58 diesel index and above is quoted at 3¾ to 4, and 53-57 diesel-index oil at 3⅝ to 3¾. Bunker C fuel is firm at 80 cents, both in bunkers and cargoes, with diesel bunkers steady at $1.50.

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